

# PIERCE

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PIERCE

MARK

1923

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# FITTER

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*H. A. CHIDISTER.*  
**Pierce Fitter**



**PIERCE, BUTLER & PIERCE  
MANUFACTURING CORP.**

Established 1839

General Sales Office

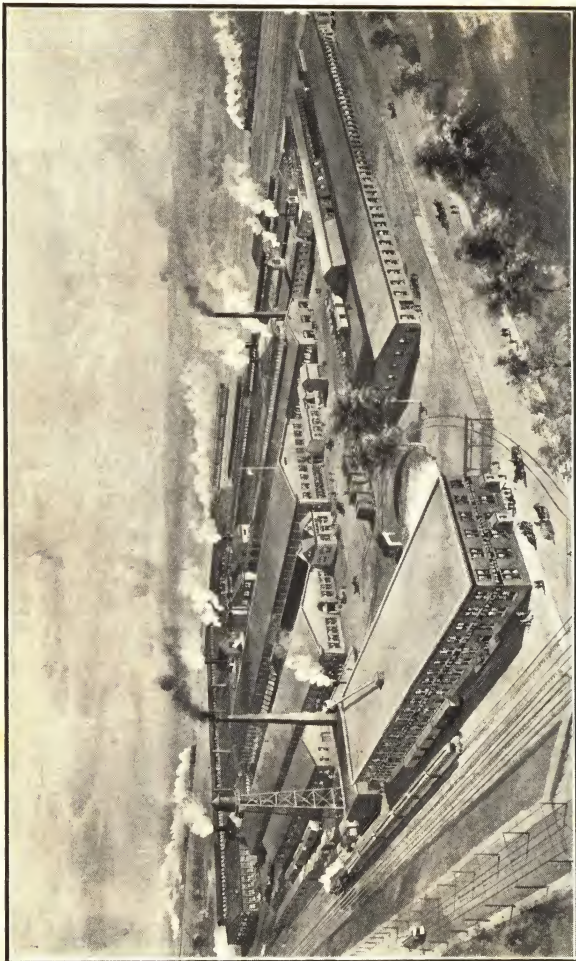
—41 East 42nd St., New York, N. Y.—

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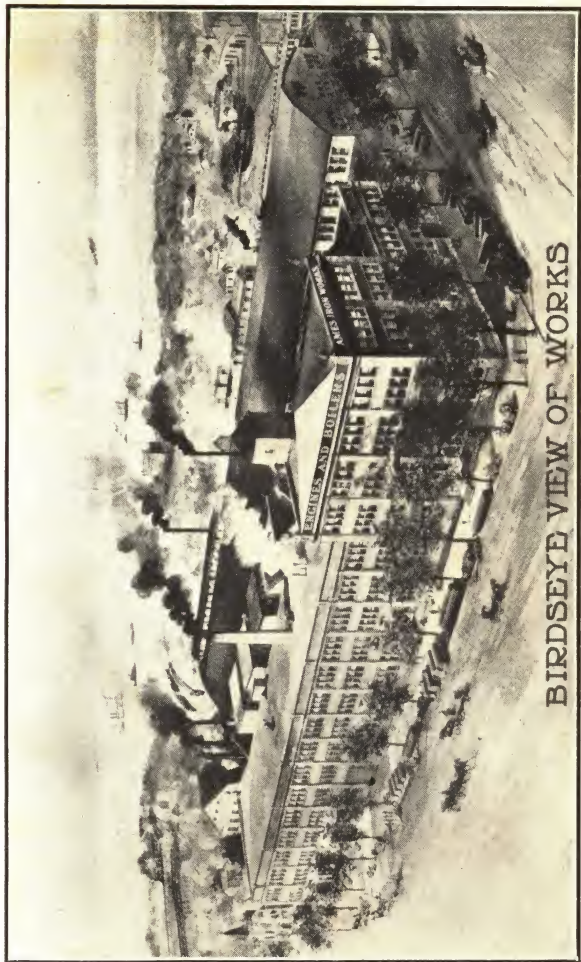
FACTORIES

Eastwood, Onondaga Co., N. Y.	
Syracuse, N. Y.	Oswego, N. Y.
Huntingdon, Pa.	Zanesville, O.



PLANT AT EASTWOOD, ONONDAGA COUNTY, NEW YORK





BIRDSEYE VIEW OF WORKS

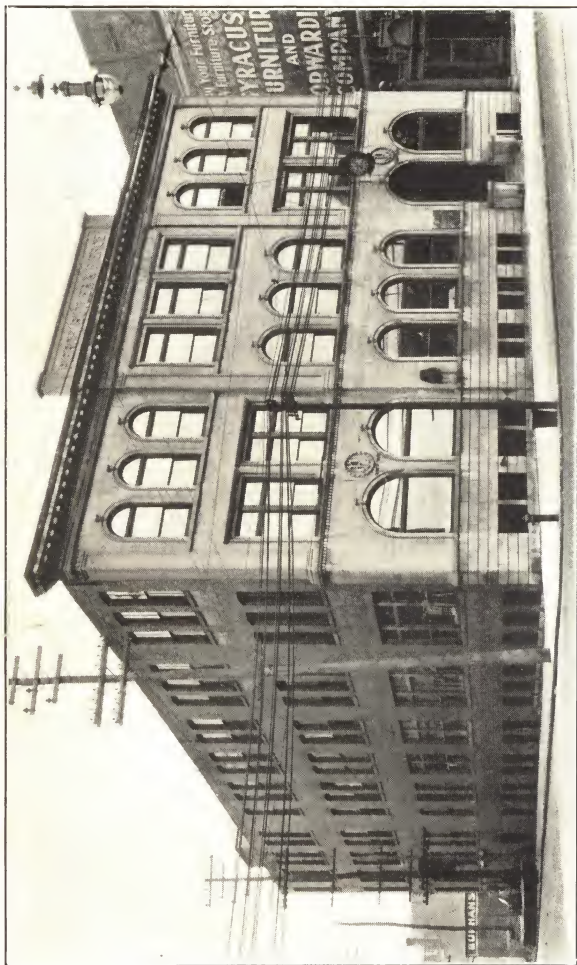
PLANT AT OSWEGO, NEW YORK



PLANT AT HUNTINGDON, PA.



PLANT AT ZANESVILLE, OHIO



VALVE AND GAUGE PLANT, SYRACUSE, N. Y.



## Introduction

**A**PERUSAL of the 1923 Pierce Fitter should acquaint its reader with every requirement of the Heating Architect and Engineer, since it undoubtedly contains the most complete line of heating materials ever placed on the market by any one manufacturer.

We own and operate the Ames Iron Works, an establishment of 60 years' standing, where we produce the superior high and low pressure Ames Steel Plate Boilers of all standard types from Fire-box Boilers for low pressure steam heating to the High Pressure Horizontal Tubular, Vertical Tubular, Locomotive Pattern (Portable, Semi-portable or Stationary) and the Empire Return Tubular for portable or stationary use. The Ames Plant first produced the renowned Unaflo Engine under the Stumpf patents. This engine is now being manufactured in sizes from 50 to 1,000 horsepower.

We operate a Valve and Gauge Factory where we manufacture valves, gauges and thermometers of every description. It is interesting to note that the original Packless Valve was a product of this laboratory. A recent addition to the widely increasing family is the No. 1 Pierce Automatic Air Valve with its five-year guarantee against escaping steam or water.

Our Eastwood Plant is also manufacturing the Pierce Smokeless Updraft Boiler which is so rapidly becoming a necessity due to the scarcity and cost of anthracite coal. In this boiler bituminous coal may be burned in perfect conformity with even the most strict smoke ordinances.

Our radiator plant at Huntingdon, Pa., produces radiators in all sizes.

Our plant at Zanesville, O., produces all sizes of radiators and a full line of round boilers.

June 1, 1923.

## Guarantee

**P**IERCE Cast Iron Boilers and Radiators are carefully tested under water pressure and are guaranteed only to the extent of furnishing new castings for any found defective in manufacture.

The rated capacities of Pierce Boilers as listed in this book are conservatively made in accordance with accepted standards but on account of varying conditions surrounding their installation, we do not guarantee them except as above and in accordance with the standard of pressure for steam and temperature for water set forth in note on following page.

The Boiler ratings are also based upon the further proviso that sufficient radiation be used to heat the building properly as above; that the apparatus be correctly installed; that the building be provided with a flue of sufficient capacity; and that the Boiler when installed, shall receive proper fuel, care and management.

Each firebox steel plate Boiler is accompanied by a Certificate of Inspection, issued by a leading Boiler Insurance company whose representative we have permanently stationed at our factory.

## Tests

**A**LL heating boilers are tested in strict accordance with the Standards of the A. S. M. E. code.

Boilers used for steam and water heating are subjected to a hydrostatic pressure of 60 pounds per square inch.

Pierce Boilers for heating domestic water supplies are tested (where shown) to 200 pounds hydrostatic pressure and guaranteed for a working pressure of 80 pounds per square inch.

## Ratings

PIERCE steam boiler ratings are based on a standard of two pounds pressure at the boiler; ratings of water boilers are based on water at a temperature of 180° F., at the outlet.

These ratings are also based on the assumption that the boilers are used with standard direct cast iron radiation. Should other forms of radiation be used, the rapidity of condensation is accelerated and due allowance must be made accordingly by computing their equivalent direct radiation. Pipe coils and wall radiation increase the boiler load equivalent to standard radiation with a 25% greater heating surface. This is also true of all exposed piping, which is just as much part of the boiler load as the actual radiators. An allowance of 33⅓% and 75% each respectively should be made for semi-direct and indirect radiation.

Our ratings are based on an eight hour firing period with the assumption that anthracite coal is the fuel and that boiler and mains shall be covered with suitable insulation. The surface of mains, not properly covered, should be figured as additional radiation as indicated in the preceding paragraph.

In determining the most efficient size of boiler, it is good practice, after ascertaining the equivalent direct radiation, to add approximately 60% for reserve capacity and rekindling charge.

If a pipe coil or cast iron section is introduced into the fire pot for heating a domestic water supply, additional capacity should be provided in selecting the correct size of boiler. The compensation in gallons per hour is two square feet of direct radiation for steam and three square feet for water.

The tank capacities as given in our list of Tank and Laundry Boilers represent the estimated size of tanks which experience has shown the boilers will supply for ordinary family requirements. Needless to say, excessive demands require additional capacity.

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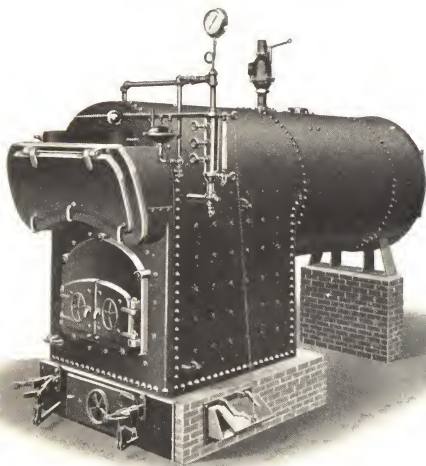
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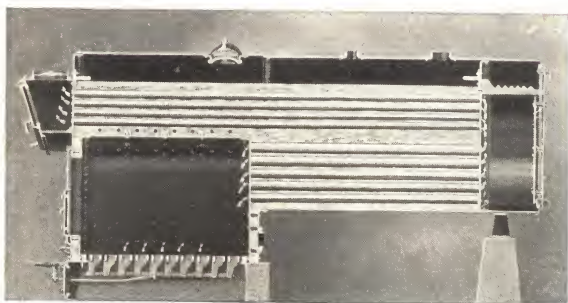
# Ames Firebox Boilers

STEAM OR HOT WATER

Plain Furnace Type



Exterior View



Longitudinal Section

# Ames Firebox Boilers

## STEAM OR HOT WATER

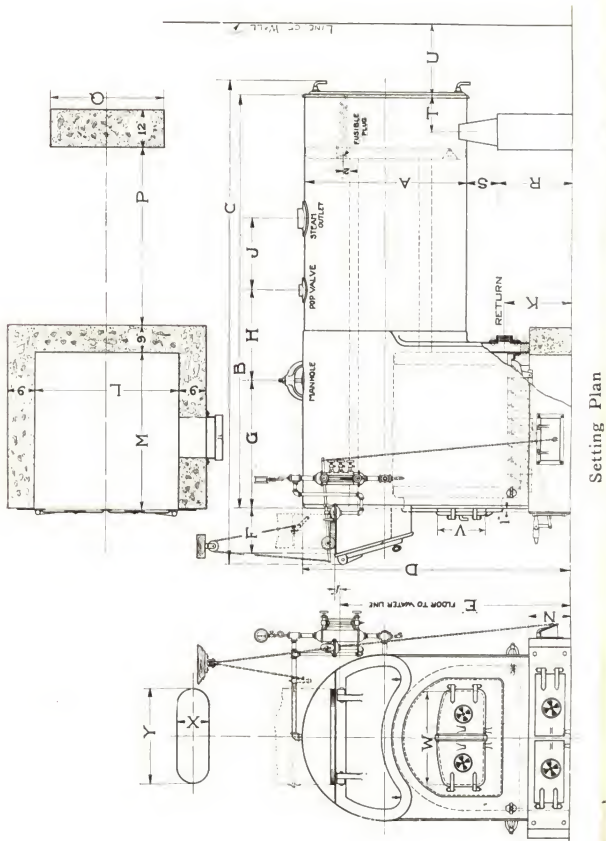
### Plain Furnace Type

No.	Ratings Steam Radia- tion, Sq. Ft.	Ratings Water Radia- tion, Sq. Ft.	Diam- eter Shell Ins.	Lgth. Fur- nace, Ins.	Width Fur- nace, Ins.	Height Furnace Above Grates, Ins.	Grate Area, Sq. Ft.	Heat'g Sur- face, Sq. Ft.	Size Steam Outlet, Ins.	Size Return, Ins.	Diam. Chimney Ins.	Height Chimney Ft.	Weight Boiler Without Fixtures Lbs.	Weight Boiler Complete Lbs.
805	2,500	3,750	42	42	36	34	10.5	249	5	3	16	50	5,830	7,100
808	4,000	6,000	48	42	42	37	12.2	403	6	4	20	60	7,980	9,370
810	5,150	7,725	54	48	48	40	16.0	511	6	4	22	55	9,270	10,980
812	6,500	9,750	54	54	48	40	18.0	613	6	4	22	70	10,460	12,320
813	7,200	10,800	54	60	48	40	20.0	661	6	4	22	75	11,160	13,170
814	7,600	11,400	60	60	54	43	22.5	726	8	6	26	60	11,910	14,120
815	8,250	12,375	60	60	54	43	22.5	763	8	6	26	65	12,130	14,340
816	9,000	13,500	60	66	54	43	24.7	826	8	6	26	70	12,970	15,340
818	10,000	15,000	60	66	54	43	24.7	900	8	6	26	75	13,760	16,040
820	11,500	17,250	66	66	60	46	27.5	1027	8	6	30	65	16,560	19,190
823	13,000	19,500	66	72	60	46	30.0	1158	8	6	30	75	17,940	20,750
825	15,000	22,500	66	72	60	46	30.0	1255	8	6	30	80	19,060	21,860
827	16,500	24,750	72	72	66	49	33.0	1349	8	6	32	75	20,840	23,920
830	18,000	27,000	72	78	66	49	35.7	1501	8	6	32	85	22,060	25,340
833	20,000	30,000	78	72	72	55	36.0	1644	10	6	36	75	24,520	27,840
837	22,500	33,750	78	84	72	55	42.0	1877	10	6	36	85	26,980	30,730
840	25,000	37,500	78	84	72	55	42.0	2017	10	6	36	90	28,890	32,640

# Ames Firebox Boilers

STEAM OR HOT WATER

Plain Furnace Type



Setting Plan



# Ames Firebox Heating Boiler with Plain Furnace

## SETTING DIMENSIONS

Number of Size	805	808	810	812	813	814	815	816	818	820	823	825	827	830	833	837	840
A Diameter Shell	42	48	54	54	54	60	60	60	60	66	66	66	72	72	78	78	78
B Length Over All	10' 3"	12' 1"	11' 9"	13' 9"	14' 9"	13' 0"	13' 6"	14' 6"	15' 6"	14' 0"	15' 6"	16' 6"	15' 6"	17' 0"	15' 6"	17' 6"	18' 6"
C Length Over All	11' 9"	13' 10"	13' 6"	15' 6"	16' 6"	14' 9"	15' 3"	16' 3"	17' 3"	15' 9"	17' 3"	18' 3"	17' 4"	18' 10"	17' 7"	19' 7"	20' 7"
D Height Top Shell	75	81	89	89	89	95	95	95	95	101	101	101	111	111	119	119	119
E Height Water Line	65	68	76	76	76	83	83	83	83	86	86	86	93	93	103	103	103
F Depth Smoke Box	12	15	15	15	15	15	15	15	15	15	15	15	16	16	19	19	19
G Location Manhole	30	36	42	48	48	48	48	54	54	54	60	60	48	54	48	60	60
H Location Pop Valve	66	32	36	36	36	36	36	36	36	42	42	42	50	50	50	50	50
I Location Steam Outlet	18	30	24	30	30	30	30	36	36	30	36	40	45	48	48	48	48
K Location Return	20	20	22	22	22	23	23	23	23	23	23	23	27	27	27	27	27
L Width Ashpit	36	42	48	48	48	54	54	54	54	60	60	60	66	66	72	72	72
M Length Ashpit	46	46	52	58	64	64	64	70	70	70	76	76	76	82	76	88	88
N Height Ashpit	12	12	14	14	14	14	14	14	14	14	14	14	18	18	18	18	18
P Location Rear Pier	53	75	65	83	89	66	72	78	90	72	84	96	84	96	84	96	108
Q Length Rear Pier	36	36	38	38	38	38	38	38	44	44	44	50	50	50	50	50	50
R Height Rear Pier	25	25	24 1/2	24 1/2	24 1/2	24 1/2	24 1/2	24 1/2	24 1/2	20	20	20	23	23	24	24	24
S Height Rear Stand	8	8	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	15	15	15	16	16	17	17	17
T Location Rear Stand	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12
U Dist. to remove 4" Tubes	24	27	30	30	30	34	34	34	34	37	37	37	40	40	42	42	42
V Height Fire Door	11 1/2	11 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 1/2	14 1/2	16	16	16	16	16
W Width Fire Door	19 1/4	19 1/4	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	40	40	40	40	40
X Width Chimney Base	9	11	11	11	11	11	11	11	11	11	11	11	12	12	15	15	15
Y Length Chimney Base	21	23	27	27	27	37	37	37	37	45	45	45	52	52	52	52	52

\*No manhole is provided in No. 805.

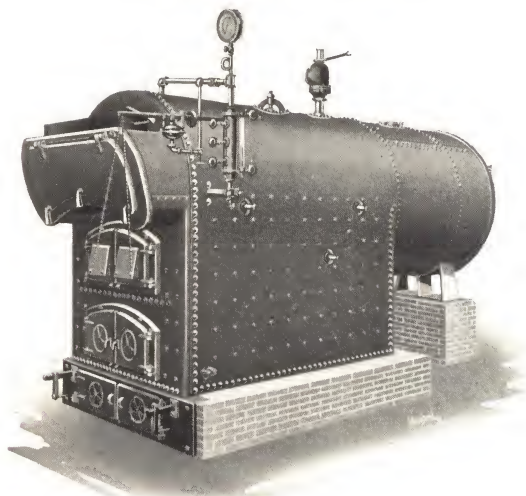
†This represents the distance from front head of boiler, and is the combination of distances G and H on above diagram.

‡Four-inch tubes may be removed through the furnace end of all boilers.

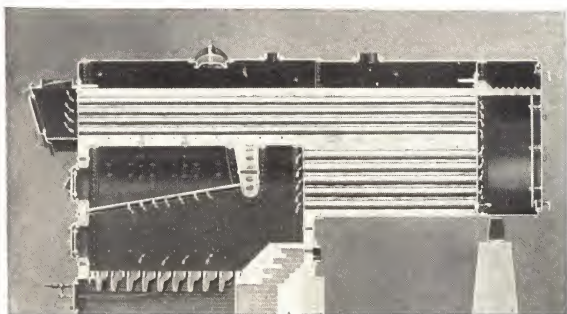
# Ames Firebox Boilers

STEAM OR HOT WATER

Downdraft Furnace Type



Exterior View



Longitudinal Section

# Ames Firebox Boilers

## STEAM OR HOT WATER

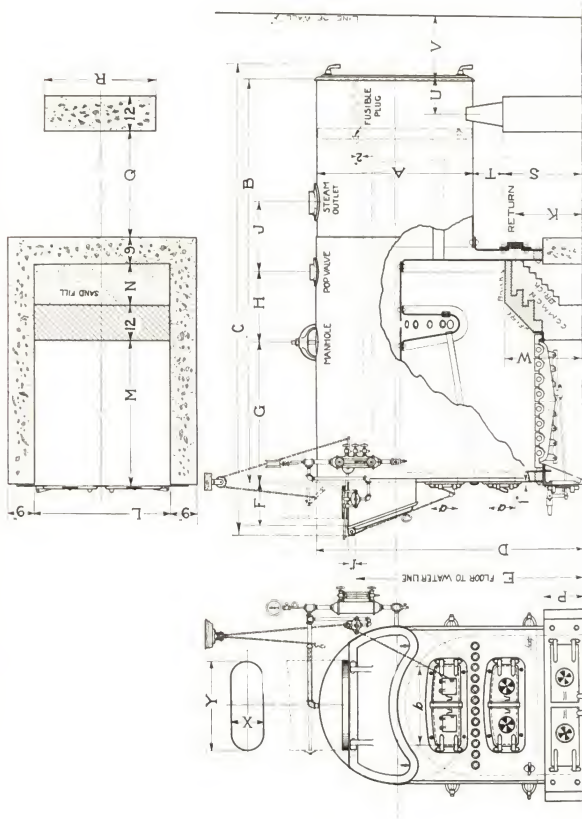
### Downdraft Furnace Type

No.	Ratings Steam Radia- tion Sq. Ft.	Ratings Water Radia- tion Sq. Ft.	Diam- eter Shell Ins.	Length Fur- nace Ins.	Width Fur- nace Ins.	Height Furnace Above Lower Grates Ins.	Length Grates Ins.	Grate Area A.S.M.E. Rating Sq. Ft.	Heat'g Sur- face Sq. Ft.	Size Steam Outlet Ins.	Size Re- turn Ins.	Diam. Chim- ney Ins.	Height Chim- ney Ft.	Weight Boiler without Fixtures Lbs.	Weight Boiler Compl. Lbs.
905	2,625	3,938	42	66	36	41	42	13.1	258	5	3	16	40	6,610	7,880
908	4,100	6,150	48	66	42	44	42	15.3	408	6	4	20	50	8,820	10,230
910	5,200	7,800	54	74	48	47	48	20.0	517	6	4	22	50	10,290	12,010
912	6,100	9,150	54	78	48	47	54	22.5	597	6	4	22	60	11,300	13,170
913	6,500	9,750	54	84	48	47	60	25.0	622	6	4	22	60	11,850	13,870
914	7,500	11,250	60	84	54	50	60	28.1	718	8	6	26	50	13,260	15,480
915	8,200	12,300	60	85	54	50	60	28.1	765	8	6	26	55	13,660	15,880
916	9,000	13,500	60	90	54	50	66	30.9	831	8	6	26	60	14,760	17,160
918	10,250	15,375	60	92	54	50	66	30.9	901	8	6	26	70	15,370	17,770
920	12,000	18,000	60	96	54	50	72	33.7	1009	8	6	26	75	16,670	19,230
923	13,500	20,250	66	97	60	53	72	37.5	1154	8	6	30	65	20,180	23,040
925	15,250	22,875	66	104	60	53	78	40.6	1286	8	6	30	75	21,480	24,300
927	16,000	24,000	66	108	60	53	84	43.7	1330	8	6	30	80	22,790	26,000
930	18,000	27,000	72	102	66	56	78	44.6	1500	10	6	32	75	24,000	27,300
933	20,000	30,000	72	104	66	56	78	44.6	1662	10	6	32	85	24,470	27,740
937	23,500	35,250	72	114	66	56	88	50.3	1810	10	6	32	95	26,550	30,230

# Ames Firebox Boilers

STEAM OR HOT WATER

Down Draft Furnace Type



Setting Plan

# Ames Firebox Heating Boiler with Downdraft Furnace

## SETTING DIMENSIONS

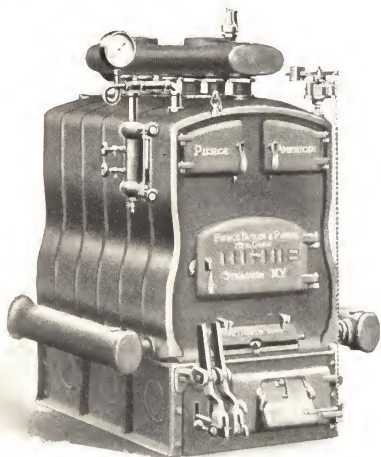
Number of Size.....	905	908	910	912	913	914	915	916	918	920	923	925	927	930	933	937
A Diameter Shell.....	42	48	54	54	54	60	60	60	60	60	66	66	66	72	72	72
B Length Shell.....	10' 3"	12' 1"	11' 9"	13' 3"	13' 9"	12' 10"	13' 6"	14' 3"	15' 6"	17' 6"	15' 6"	17' 6"	17' 6"	17' 6"	18' 6"	20' 0"
C Length Over All.....	11' 9"	13' 10"	13' 6"	15' 0"	15' 6"	14' 7"	15' 3"	16' 3"	17' 3"	18' 9"	17' 3"	18' 9"	19' 3"	18' 10"	20' 4"	21' 10"
D Height Top Shell.....	78	84	92	92	92	98	98	98	98	98	104	104	104	114	114	114
E Height Water Line.....	68	71	79	79	79	86	86	86	86	86	89	89	89	96	96	96
F Depth Smoke Box.....	12	15	15	15	15	15	15	15	15	15	15	15	15	16	16	16
G Location Manhole.....	*	38	48	50	56	56	54	40	40	42	45	52	56	52	48	62
H Location Pop Valve.....	60	24	24	24	24	24	24	48	48	48	48	48	48	48	48	48
I Location Steam Outlet.....	30	36	30	36	36	30	36	36	36	36	36	36	36	36	36	36
K Location Return.....	20	20	22	22	22	23	23	23	23	23	23	23	23	27	27	27
L Width Ashpit.....	36	42	48	48	48	54	54	54	54	54	60	60	60	66	66	66
M Length Ashpit.....	45	45	51	57	63	63	63	69	69	75	75	81	87	81	81	91
N Width Sand Fill.....	12	12	14	12	12	12	13	12	14	12	13	14	12	12	14	14
P Height Ashpit.....	12	12	14	14	14	14	14	14	14	14	14	14	14	18	18	18
Q Location Rear Pier.....	30	52	40	54	54	41	48	55	65	79	60	71	73	73	89	97
R Length Rear Pier.....	36	36	38	38	38	38	38	38	38	38	44	44	44	50	50	50
S Height Rear Pier.....	28	28	27 1/2	27 1/2	27 1/2	27 1/2	27 1/2	27 1/2	27 1/2	27 1/2	23	23	23	26	26	26
T Height Rear Stand.....	8	8	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	15	15	15	16	16	16
U Location Rear Stand.....	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12
V Distance to remove 4" Tubes.....	14	36	24	38	38	21	28	35	45	59	40	51	53	53	69	77
W Height Bridge Wall.....	32	34	32	32	32	36	36	36	36	36	37	37	37	41	41	41
X Width Chimney Base.....	9	11	11	11	11	11	11	11	11	11	11	11	11	12	12	12
Y Length Chimney Base.....	21	23	27	27	27	37	37	37	37	37	45	45	45	52	52	52
a Height Fire Door.....	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	11 1/4	14	14	14
b Width Fire Door.....	19 1/4	19 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4	40	40	40

\*No manhole is provided in No. 905.

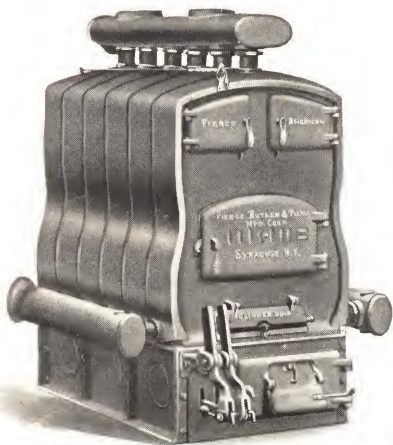
†This represents the distance from front head of boiler, and is the combination of distances G and H on above diagram.



# The Pierce American Boiler



21 Series—Steam



21 Series—Water

# The Pierce American Boiler

## 21 SERIES—STEAM

No.	*Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq.Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	Wdth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
S 214	600	4	3.31	47	56½	45	2-3	2-3
S 215	800	5	4.44	55	56½	45	2-3	2-3
S 216	1000	6	5.58	63	56½	45	2-3	2-3
S 217	1200	7	6.72	71	58	45	2-4	2-3

## 21 SERIES—WATER

W214	1000	4	3.31	47	56½	45	2-3	2-3
W215	1325	5	4.44	55	56½	45	2-3	2-3
W216	1650	6	5.58	63	56½	45	2-3	2-3
W217	2000	7	6.72	71	58	45	2-4	2-3

Height of water line, 40¼ inches.

Safety valve sizes comply with A. S. M. E. boiler code.

Size of oval smoke pipe, 12x6¾ inches on all sizes equals in area approximately 9½ inches diameter.

†These figures are the over all dimensions, including shaker arms and smoke hood.

‡Special sizes or location of tappings can be furnished at prices shown in discount sheet.

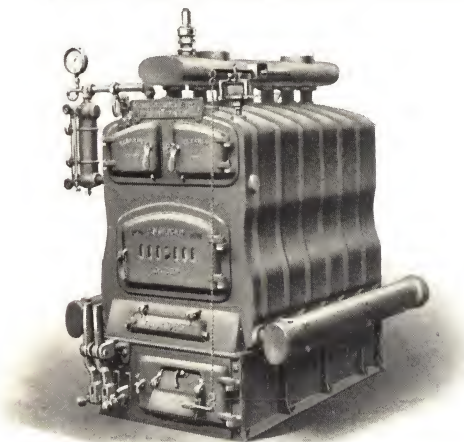
See note regarding ratings, page 9.

Repairs for boiler are listed on page 259.

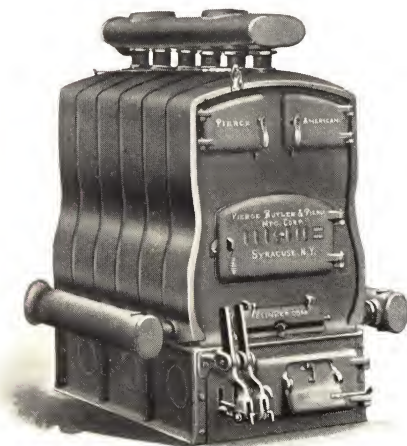
## Chimney Dimensions

Boiler number	214	215	216	217
Size of flue, in.	8x12	8x12	12x12	12x12
Height of chimney, ft.	35	35	40	40

# The Pierce American Boiler



26 Series—Steam



26 Series—Water

# The Pierce American Boiler

## 26 SERIES—STEAM

No.	*Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq. Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	Wdth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
S 265	1100	5	5.44	55	64½	51	2-3	2-3
S 266	1400	6	6.83	63	64½	51	2-4	2-4
S 267	1700	7	8.25	71	64½	51	2-4	2-4
S 268	2000	8	9.61	79	64½	51	2-4	2-4

## 26 SERIES—WATER

W265	1825	5	5.44	55	64½	51	2-3	2-3
W266	2325	6	6.83	63	64½	51	2-4	2-4
W267	2825	7	8.25	71	64½	51	2-4	2-4
W268	3325	8	9.61	79	64½	51	2-4	2-4

Height of water line, 47¾ inches.

†These figures are the over all dimensions, including shaker arms and smoke hood. They do not include the removable shaker handle.

Safety valve sizes comply with A. S. M. E. boiler code.

Size of oval smoke pipe 14x8¾ inches on all sizes equals in area approximately 11¾ inches diameter.

‡Special sizes or location of tappings can be furnished at prices shown in discount sheet.

See note regarding ratings, page 9.

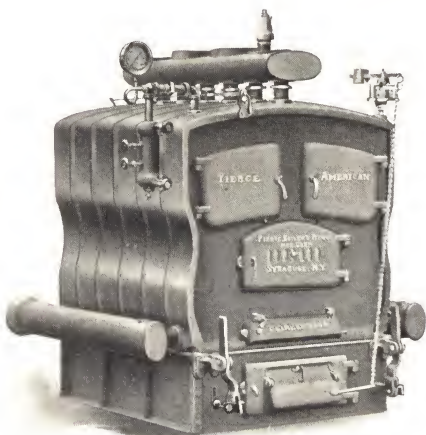
Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge with boiler if so ordered.

Repairs for boiler are listed on pages 260-261.

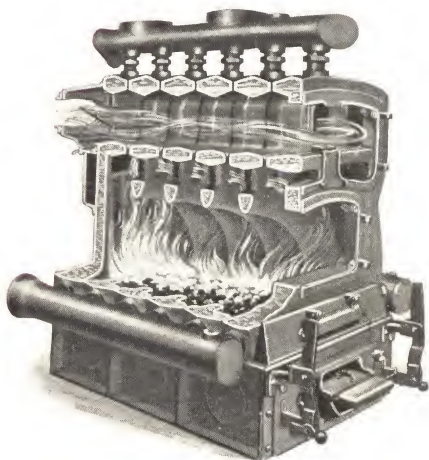
## Chimney Dimensions

Boiler number	265	266	267	268
Size of flue, in.	12x12	12x12	12x16	12x16
Height of chimney, ft.	40	40	50	50

# The Pierce American Boiler



32 Series—Steam



32 Series—Water



# The Pierce American Boiler

## 32 SERIES—STEAM

No.	*Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq.Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	Wdth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
S 325	1400	5	6.78	55	67	59¼	2-4	2-4
S 326	1750	6	8.50	63	67	59¼	2-5	2-5
S 327	2100	7	10.22	71	67	59¼	2-5	2-5
S 328	2450	8	11.95	79	67	59¼	2-5	2-5
S 329	2800	9	13.66	87	67	59¼	2-5	2-5

## 32 SERIES—WATER

W325	2325	5	6.78	55	67	59¼	2-4	2-4
W326	2900	6	8.50	63	67	59¼	2-5	2-5
W327	3475	7	10.22	71	67	59¼	2-5	2-5
W328	4050	8	11.95	79	67	59¼	2-5	2-5
W329	4625	9	13.66	87	67	59¼	2-5	2-5

Height of water line, 49 inches.

Safety valve sizes comply with A. S. M. E. boiler code.

Size of oval smoke pipe, 15¾x11¼ inches on all sizes equals in area approximately 14 inches diameter.

†These figures are the over all dimensions, including shaker arms and smoke hood. They do not include the removable shaker handle.

‡Special sizes or location of tappings can be furnished at prices shown in discount sheet.

\*See note regarding ratings, page 9.

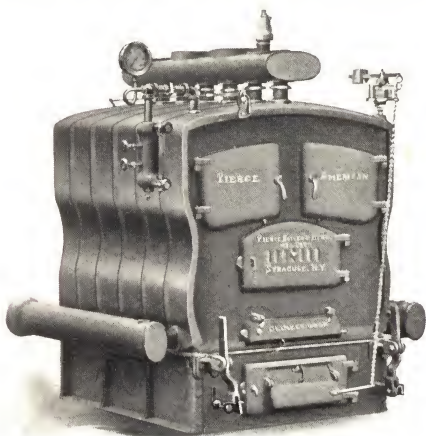
Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Repairs for boiler are listed on pages 262-263.

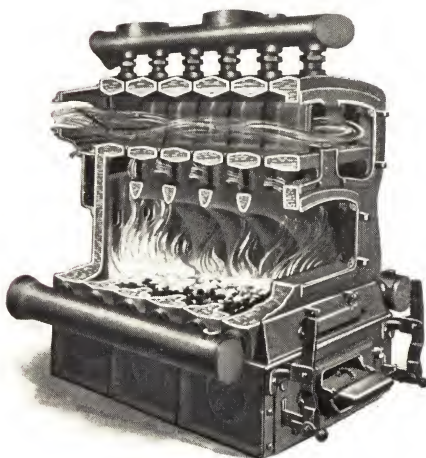
## Chimney Dimensions

No. of boiler	325	326	327	328	329
Size of flue, in.	12x16	12x16	16x16	16x16	16x16
Height of chimney, ft.	40	40	40	50	50

# The Pierce American Boiler



40 Series—Steam



40 Series—Water

# The Pierce American Boiler

## 40 SERIES—STEAM

No.	*Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq.Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	Wdth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
S 405	1900	5	8.53	55	69¼	66½	2-4	2-4
S 406	2400	6	10.70	63	69¼	66½	2-5	2-5
S 407	2900	7	12.86	71	69¼	66½	2-5	2-5
S 408	3400	8	15.03	79	69¼	66½	2-5	2-5
S 409	3900	9	17.19	87	69¼	66½	2-5	2-5
S 4010	4400	10	19.36	95	69¼	66½	2-5	2-5

## 40 SERIES—WATER

W 405	3150	5	8.53	55	69¼	66½	2-4	2-4
W 406	3975	6	10.70	63	69¼	66½	2-5	2-5
W 407	4800	7	12.86	71	69¼	66½	2-5	2-5
W 408	5625	8	15.03	79	69¼	66½	2-5	2-5
W 409	6450	9	17.19	87	69¼	66½	2-5	2-5
W 4010	7275	10	19.36	95	69¼	66½	2-5	2-5

Height of water line, 51 inches.

Safety valve sizes comply with A. S. M. E. boiler code.

Size of oval smokepipe, 18x12¾ inches on all sizes equals in area approximately 15¾ inches in diameter.

†These figures are the over all dimensions, including shaker arms and smoke hood. They do not include the removable shaker handle.

‡Special sizes or location of tappings can be furnished at prices shown in discount sheet.

See note regarding ratings, page 9.

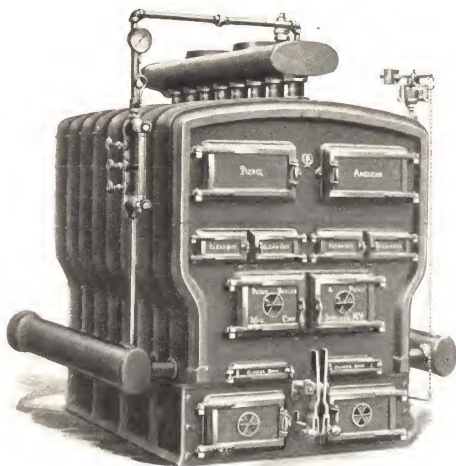
Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Repairs for boiler are listed on pages 264-265.

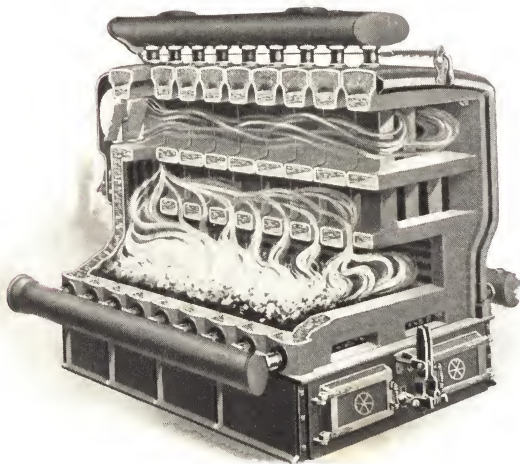
## Chimney Dimensions

Number of boiler	405	406	407
Size of flue, in.	12x16	16x16	16x16
Height of chimney, ft.	40	40	50
Number of boiler	408	409	4010
Size of flue, in.	16x20	20x20	20x20
Height of chimney, ft.	50	50	50

# The Pierce American Boiler



46 Series—Steam



46 Series—Water

# The Pierce American Boiler

## 46 SERIES—STEAM

No.	*Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq.Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	Wdth. Incl. Head- ers	No. and Size Outlets	No. and Size Ret'ns
S 466	3750	6	12.90	68	82	79	2-6	2-6
S 467	4500	7	15.48	76	82	79	2-6	2-6
S 468	5250	8	18.06	84	82	79	2-6	2-6
S 469	6000	9	20.64	92	82	79	2-6	2-6
S 4610	6750	10	23.22	100	82	79	2-6	2-6
S 4611	7500	11	25.80	108	82	79	2-6	2-6
S 4612	8250	12	28.38	116	82	79	2-6	2-6
S 4613	9000	13	30.96	124	82	79	2-6	2-6

## 46 SERIES—WATER

W 466	6200	6	12.90	68	82	79	2-6	2-6
W 467	7450	7	15.48	76	82	79	2-6	2-6
W 468	8700	8	18.06	84	82	79	2-6	2-6
W 469	9950	9	20.64	92	82	79	2-6	2-6
W 4610	11200	10	23.22	100	82	79	2-6	2-6
W 4611	12450	11	25.80	108	82	79	2-6	2-6
W 4612	13700	12	28.38	116	82	79	2-6	2-6
W 4613	14950	13	30.96	124	82	79	2-6	2-6

†Height of water line, 55¾ inches.

Safety valve sizes comply with A. S. M. E. boiler code.

Size of oval smoke pipe, 22x16¾ inches on all sizes equals in area approximately 19¾ inches.

See note regarding ratings, page 9.

Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Repairs for above boilers are listed on pages 266-268.

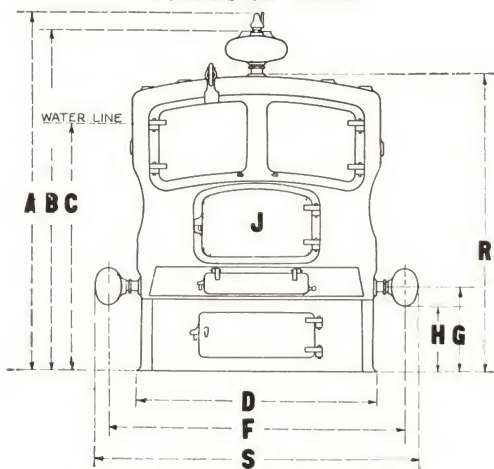
## Chimney Dimensions

Boiler number	466	467	468	469
Size of flue, in.	20x20	20x20	20x20	20x20
Height of chimney, ft.	50	50	60	60
Boiler number	4610	4611	4612	4613
Size of flue, in.	24x24	24x24	24x24	24x24
Height of chimney, ft.	60	60	70	70



# The Pierce American Boiler

## DIMENSION TABLE

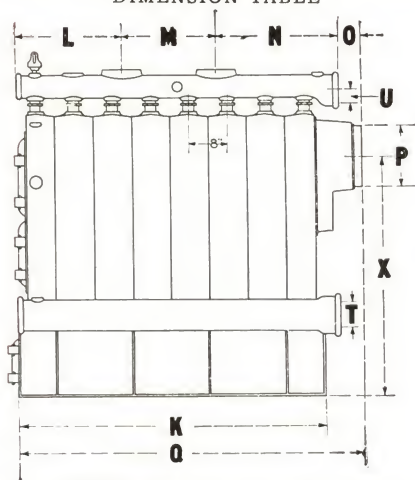


For Dimensions K to N see page 35

Number	A	B	C	D	F	G	H	J
214	61 $\frac{1}{2}$	56 $\frac{1}{2}$	40 $\frac{1}{4}$	26	38 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	12 $\frac{1}{4}$ x 8 $\frac{1}{4}$
215	61 $\frac{1}{2}$	56 $\frac{1}{2}$	40 $\frac{1}{4}$	26	38 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	12 $\frac{1}{4}$ x 8 $\frac{1}{4}$
216	61 $\frac{1}{2}$	56 $\frac{1}{2}$	40 $\frac{1}{4}$	26	38 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	12 $\frac{1}{4}$ x 8 $\frac{1}{4}$
217	61 $\frac{1}{2}$	56 $\frac{1}{2}$	40 $\frac{1}{4}$	26	38 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	12 $\frac{1}{4}$ x 8 $\frac{1}{4}$
265	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{2}$
266	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{2}$
267	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{2}$
268	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{2}$
325	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{4}$
326	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{4}$
327	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{4}$
328	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{4}$
329	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x 11 $\frac{1}{4}$
405	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x 11
406	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x 11
407	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x 11
408	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x 11
409	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x 11
4010	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x 11
466	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
467	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
468	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
469	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
4610	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
4611	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
4612	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$
4613	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x 11 $\frac{1}{2}$

# The Pierce American Boiler

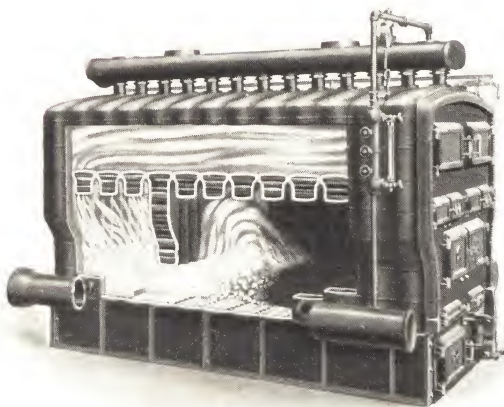
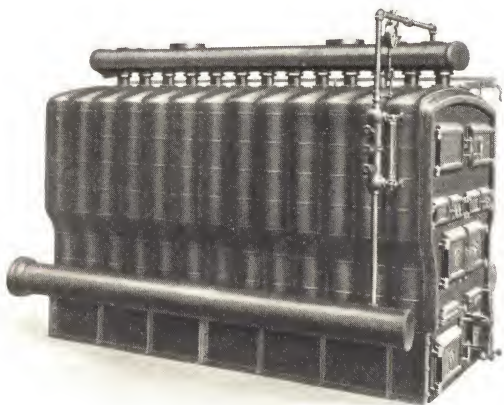
## DIMENSION TABLE



For Dimensions A to J see page 34

No.	K	L	M	N	O	P	Q	R	S	T	U	X
214	33 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{4}$	40 $\frac{1}{2}$	48	45	3	2	41
215	41 $\frac{1}{2}$	16 $\frac{1}{2}$	16	10 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{4}$	48 $\frac{1}{2}$	48	45	3	2	41
216	49 $\frac{1}{2}$	16 $\frac{1}{2}$	24	10 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{4}$	56 $\frac{1}{2}$	48	45	3	2	41
217	57 $\frac{1}{2}$	16 $\frac{1}{2}$	32	10 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{4}$	64 $\frac{1}{2}$	48	45	4	2	41
265	41 $\frac{1}{2}$	16 $\frac{1}{2}$	16	10 $\frac{1}{2}$	4 $\frac{1}{2}$	8 $\frac{3}{4}$	48 $\frac{1}{2}$	55 $\frac{1}{2}$	51	3	2	47 $\frac{1}{4}$
266	49 $\frac{1}{2}$	16 $\frac{1}{2}$	24 $\frac{1}{2}$	10 $\frac{1}{2}$	4 $\frac{1}{2}$	8 $\frac{3}{4}$	56 $\frac{1}{2}$	55 $\frac{1}{2}$	51	4	2	47 $\frac{1}{4}$
267	57 $\frac{1}{2}$	16 $\frac{1}{2}$	32	10 $\frac{1}{2}$	4 $\frac{1}{2}$	8 $\frac{3}{4}$	64 $\frac{1}{2}$	55 $\frac{1}{2}$	51	4	2	47 $\frac{1}{4}$
268	65 $\frac{1}{2}$	16 $\frac{1}{2}$	40 $\frac{1}{2}$	10 $\frac{1}{2}$	4 $\frac{1}{2}$	8 $\frac{3}{4}$	72 $\frac{1}{2}$	55 $\frac{1}{2}$	51	4	2	47 $\frac{1}{4}$
325	41 $\frac{3}{4}$	18	14	10 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	48 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	4	2 $\frac{1}{2}$	49 $\frac{1}{2}$
326	49 $\frac{3}{4}$	20	14	17 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	56 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
327	57 $\frac{3}{4}$	16 $\frac{1}{2}$	22 $\frac{1}{2}$	17 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	64 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
328	65 $\frac{3}{4}$	22	19 $\frac{3}{4}$	25 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	72 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
329	73 $\frac{3}{4}$	22	27 $\frac{1}{4}$	25 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	80 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
405	41 $\frac{1}{2}$	18	14	9	7	12 $\frac{3}{4}$	48 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	4	2 $\frac{1}{2}$	49 $\frac{1}{2}$
406	49 $\frac{3}{4}$	20	14	14 $\frac{1}{2}$	7	12 $\frac{3}{4}$	56 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
407	57 $\frac{3}{4}$	16 $\frac{1}{2}$	22 $\frac{1}{2}$	16	7	12 $\frac{3}{4}$	64 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
408	65 $\frac{3}{4}$	22	19 $\frac{3}{4}$	24	7	12 $\frac{3}{4}$	72 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
409	73 $\frac{3}{4}$	22	27 $\frac{3}{4}$	24	7	12 $\frac{3}{4}$	80 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
4010	89 $\frac{3}{4}$	22	35 $\frac{3}{4}$	24	7	12 $\frac{3}{4}$	88 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
466	50	21 $\frac{1}{2}$	15	13 $\frac{1}{2}$	8 $\frac{1}{2}$	16 $\frac{1}{2}$	60	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
467	58	21 $\frac{1}{2}$	15 $\frac{1}{4}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	68	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
468	66	21 $\frac{1}{2}$	23	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	76	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
469	74	21 $\frac{1}{2}$	31 $\frac{1}{2}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	84	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4610	82	21 $\frac{1}{2}$	39	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	92	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4611	90	21 $\frac{1}{2}$	47 $\frac{1}{2}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	100	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4612	98	21 $\frac{1}{2}$	55 $\frac{1}{2}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	108	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4613	106	30 $\frac{1}{2}$	48 $\frac{1}{4}$	29	8 $\frac{1}{2}$	16 $\frac{1}{2}$	116	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$

# Pierce American Updraft Smokeless Boilers



## The Pierce American Smokeless Updraft Boiler

THIS boiler is modeled along the lines of the Pierce American Boiler. All the elements of strength that have gone into the Pierce American's thirty year record of success have been incorporated in the design of the Pierce American Smokeless Updraft Boiler.

The essential difference lies in the drop water section. As the gases are liberated in the first combustion chamber, this section forces these gases under and through the narrow openings and into a second combustion chamber. This brings them into contact with the bright fire by which the remaining gases and minute coal particles are ignited, resulting in thorough combustion.

Smokeless Operation means Perfect Combustion.

# The Pierce American Smokeless Updraft Boiler

## 26 SERIES—STEAM

No.	†Steam Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq.Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	*Wth. Incl. Head- ers	†No. and Size Outlets	†No. and Size Ret'ns
SM266	1400	6	6.83	63	64½	51	2-4	2-4
SM267	1700	7	8.25	71	64½	51	2-4	2-4
SM268	2000	8	9.61	79	64½	51	2-4	2-4

## 26 SERIES—WATER

WM266	2325	6	6.83	63	64½	51	2-4	2-4
WM267	2825	7	8.25	71	64½	51	2-4	2-4
WM268	3325	8	9.61	79	64½	51	2-4	2-4

Height water line, 47  $\frac{7}{8}$  inches.

Safety valve sizes comply with A. S. M. E. boiler code.

All measurements are in inches except where otherwise noted.

†These figures are the over all dimensions, including shaker arms and smoke hood. They do not include the removable shaker handle.

\*These are extreme measurements.

†See note regarding ratings, page 9.

‡Special size smoke pipe and special sizes or location of tappings can be furnished at net prices shown on discount sheet. Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Size of oval smoke pipe 14x8  $\frac{3}{4}$  inches on all sizes equals in area approximately 11  $\frac{3}{4}$  inches diameter round.

For other dimensions see diagram of Pierce American Boiler on pages 34-35.

Repair parts for this boiler listed on page 269.

## Chimney Dimensions

Boiler number	265	266	267	268
Size of flue, in.	12x12	12x12	12x16	12x16
Height of chimney, ft.	40	40	50	50



# The Pierce American Smokeless Updraft Boiler

## 32 SERIES—STEAM

No.	†Steam Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq. Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	*Wth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
SM326	1750	6	8.50	63	67	59¼	2-5	2-5
SM327	2100	7	10.22	71	67	59¼	2-5	2-5
SM328	2450	8	11.95	79	67	59¼	2-5	2-5
SM329	2800	9	13.66	87	67	59¼	2-5	2-5

## 32 SERIES—WATER

WM326	2900	6	8.50	63	67	59¼	2-5	2-5
WM327	3475	7	10.22	71	67	59¼	2-5	2-5
WM328	4050	8	11.95	79	67	59¼	2-5	2-5
WM329	4625	9	13.66	87	67	59¼	2-5	2-5

Height water line, 49 inches.

Safety valve sizes comply with A. S. M. E. boiler code.

†These figures are the overall dimensions including the removable shaker handle.

\*These are extreme measurements.

‡See note regarding ratings, page 9.

‡Special size smoke pipe and special sizes or location of tappings can be furnished at net prices shown on discount sheet. Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Size of oval smoke pipe, 15¾x11¼ inches on all sizes equals in area approximately 14 inches diameter round.

For other dimensions see diagram of Pierce American Boiler on pages 34-35.

Repair parts for this boiler listed on page 269.

## Chimney Dimensions

Number of boiler	326	327	328	329
Size of flue, in.	12x16	16x16	16x16	16x16
Height of chimney, ft.	40	40	50	50

# The Pierce American Smokeless Updraft Boiler

## 40 SERIES—STEAM

No.	†Steam Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq. Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	*Wth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
SM407	2900	7	12.86	71	69¼	66½	2-5	2-5
SM408	3400	8	15.03	79	69¼	66½	2-5	2-5
SM409	3900	9	17.19	87	69¼	66½	2-5	2-5
SM4010	4400	10	19.36	95	69¼	66½	2-5	2-5
SM4011	4900	11	19.36	103	69¼	66½	2-5	2-5
SM4012	5400	12	19.36	111	69¼	66½	2-5	2-5

## 40 SERIES—WATER

WM407	4800	7	12.86	71	69¼	66½	2-5	2-5
WM408	5625	8	15.03	79	69¼	66½	2-5	2-5
WM409	6450	9	17.19	87	69¼	66½	2-5	2-5
WM4010	7275	10	19.36	95	69¼	66½	2-5	2-5
WM4011	8100	11	19.36	103	69¼	66½	2-5	2-5
WM4012	8925	12	19.36	111	69¼	66½	2-5	2-5

Height of water line, 51 inches.

Safety valve sizes comply with A. S. M. E. boiler code.

†These figures are the over all dimensions, including shaker arms and smoke hood. They do not include the removable shaker handle.

\*These are extreme measurements.

†See note regarding ratings, page 9.

‡Special size smoke pipe and special sizes or location of tappings can be furnished at net prices shown on discount sheet. Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Size of oval smoke pipe, 18x12¾ inches on all sizes equals in area approximately 15¾ inches diameter round.

For other dimensions see diagram of Pierce American Boiler on pages 34-35.

Repair parts for this boiler listed on page 269.

## Chimney Dimensions

Number of boiler	407	408	409	4010	4011	4012
Size of flue, in.	16x16	16x20	20x20	20x20	20x20	20x20
Height of chimney, ft.	50	50	50	50	60	60

# The Pierce American Smokeless Updraft Boiler

## 46 SERIES—STEAM

No.	†Steam Ratings Sq. Ft.	No. Sec- tions	Grate Area Sq.Ft.	†Lgth. Boiler Ins.	Ht. Incl. Head- ers	*Wth. Incl. Head- ers	‡No. and Size Outlets	‡No. and Size Ret'ns
SM468	5250	8	18.06	84	82	79	2-6	2-6
SM469	6000	9	20.64	92	82	79	2-6	2-6
SM4610	6750	10	23.22	100	82	79	2-6	2-6
SM4611	7500	11	23.22	108	82	79	2-6	2-6
SM4612	8250	12	23.22	116	82	79	2-6	2-6
SM4613	9000	13	23.22	124	82	79	2-6	2-6
SM4614	9750	14	23.22	132	82	79	2-6	2-6

## 46 SERIES—WATER

WM468	8700	8	18.06	84	82	79	2-6	2-6
WM469	9950	9	20.64	92	82	79	2-6	2-6
WM4610	11200	10	23.22	100	82	79	2-6	2-6
WM4611	12450	11	23.22	108	82	79	2-6	2-6
WM4612	13700	12	23.22	116	82	79	2-6	2-6
WM4613	14950	13	23.22	124	82	79	2-6	2-6
WM4614	16200	14	23.22	132	82	79	2-6	2-6

Height water line, 55¾ inches.

Safety valve sizes comply with A. S. M. E. boiler code.

†These figures are the over all dimensions, including shaker arms and smoke hood. They do not include the removable shaker handle.

\*These are extreme measurements.

†See note regarding ratings, page 9.

‡Special size smoke pipe and special sizes or location of tappings can be furnished at net prices shown on discount sheet. Blank grate sections for brick fire wall to reduce size of grate will be supplied without extra charge when boiler is so ordered.

Size of oval smoke pipe, 22x16¾ inches on all sizes equals in area approximately 19¾ inches round.

For other dimensions see diagram of Pierce American Boiler on pages 34-35.

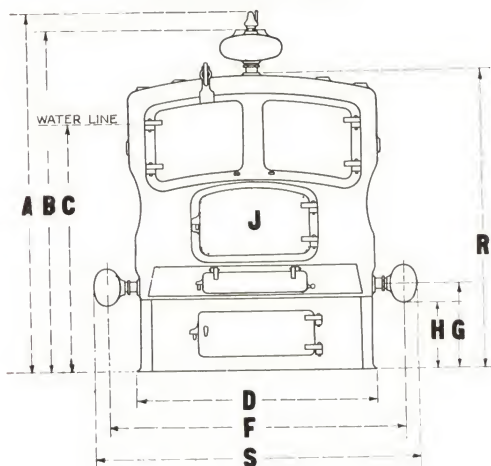
Repair parts for boiler listed on page 269.

## Chimney Dimensions

Boiler number	468	469	4610	4611	4612	4613	4614
Size of flue, in.	20x20	20x20	24x24	24x24	24x24	24x24	28x28
Height chimney, ft.	60	60	60	60	70	70	70

# The Pierce American Smokeless Updraft Boiler

## DIMENSION TABLE

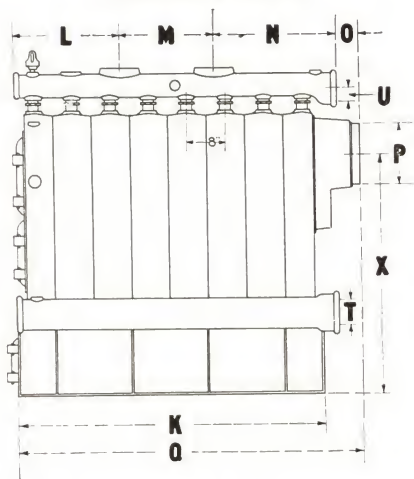


For Dimensions K to X, see page 43

Number	A	B	C	D	F	G	H	J
266	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{5}{8}$
267	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{5}{8}$
268	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{5}{8}$
269	71	64 $\frac{1}{2}$	47 $\frac{7}{8}$	31	44	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{5}{8}$
326	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{1}{2}$
327	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{1}{2}$
328	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{1}{2}$
329	74	67	49	37 $\frac{3}{4}$	51	16 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{3}{4}$ x11 $\frac{1}{2}$
407	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x11
408	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x11
409	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x11
4010	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x11
4011	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x11
4012	75	69 $\frac{1}{4}$	51	45 $\frac{1}{4}$	58 $\frac{1}{4}$	16 $\frac{1}{2}$	13 $\frac{1}{2}$	21 $\frac{3}{4}$ x11
468	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$
469	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$
4610	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$
4611	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$
4612	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$
4613	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$
4614	89	82	55 $\frac{3}{4}$	52 $\frac{1}{4}$	69	18 $\frac{1}{2}$	15	31 $\frac{1}{2}$ x11 $\frac{1}{2}$

# The Pierce American Smokeless Updraft Boiler

DIMENSION TABLE



For Dimensions A to J, see page 42

No.	K	L	M	N	O	P	Q	R	S	T	U	X
266	49 $\frac{1}{4}$	16 $\frac{1}{4}$	24 $\frac{1}{8}$	10 $\frac{1}{2}$	4 $\frac{1}{4}$	8 $\frac{3}{4}$	56 $\frac{1}{2}$	55 $\frac{1}{2}$	51	4	2	47 $\frac{1}{4}$
267	57 $\frac{1}{4}$	16 $\frac{1}{4}$	32	10 $\frac{1}{2}$	4 $\frac{1}{4}$	8 $\frac{3}{4}$	64 $\frac{1}{2}$	55 $\frac{1}{2}$	51	4	2	47 $\frac{1}{4}$
268	65 $\frac{1}{4}$	16 $\frac{1}{4}$	40 $\frac{1}{4}$	10 $\frac{1}{2}$	4 $\frac{1}{4}$	8 $\frac{3}{4}$	72 $\frac{1}{2}$	55 $\frac{1}{2}$	51	4	2	47 $\frac{1}{4}$
326	49 $\frac{3}{4}$	20	14	17 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	56 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
327	57 $\frac{3}{4}$	16 $\frac{1}{2}$	22 $\frac{1}{2}$	17 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	64 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
328	65 $\frac{3}{4}$	22	19 $\frac{1}{4}$	25 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	72 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
329	73 $\frac{3}{4}$	22	27 $\frac{1}{4}$	25 $\frac{1}{2}$	4 $\frac{1}{2}$	11 $\frac{1}{4}$	80 $\frac{1}{2}$	57 $\frac{1}{2}$	59 $\frac{1}{4}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
407	57 $\frac{3}{4}$	16 $\frac{1}{2}$	22 $\frac{1}{2}$	16	7	12 $\frac{3}{4}$	64 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
408	65 $\frac{3}{4}$	22	19 $\frac{3}{4}$	24	7	12 $\frac{3}{4}$	72 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
409	73 $\frac{3}{4}$	22	27 $\frac{3}{4}$	24	7	12 $\frac{3}{4}$	80 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
4010	89 $\frac{3}{4}$	22	35 $\frac{3}{4}$	24	7	12 $\frac{3}{4}$	88 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
4011	89 $\frac{3}{4}$	22	44	24	7	12 $\frac{3}{4}$	96 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
4012	98 $\frac{3}{4}$	24	50 $\frac{1}{2}$	24	7	12 $\frac{3}{4}$	104 $\frac{1}{2}$	59 $\frac{1}{2}$	66 $\frac{1}{2}$	5	2 $\frac{1}{2}$	49 $\frac{1}{2}$
468	66	21 $\frac{1}{2}$	23	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	76	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
469	74	21 $\frac{1}{2}$	31 $\frac{1}{2}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	84	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4610	82	21 $\frac{1}{2}$	39	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	92	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4611	90	21 $\frac{1}{2}$	47 $\frac{1}{2}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	100	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4612	98	21 $\frac{1}{2}$	55 $\frac{1}{2}$	21	8 $\frac{1}{2}$	16 $\frac{1}{2}$	108	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4613	106	30 $\frac{1}{2}$	48 $\frac{1}{4}$	29	8 $\frac{1}{2}$	16 $\frac{1}{2}$	116	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$
4614	114	30 $\frac{1}{2}$	56	29	8 $\frac{1}{2}$	16 $\frac{1}{2}$	124	69 $\frac{3}{4}$	79	6	3	59 $\frac{1}{4}$



## The Pierce Down Draft Boiler

An unusual heating boiler that has no real competitor: designed especially for the most exacting trade. Its distinguishing features are:

*Magazine Feed*—The capacious fuel magazine accommodates a large charge of coal, and in consequence the boiler requires attention only at very long intervals.

*Uniform Operation*—The combustion takes place in the lower part of the magazine, as shown in the illustration on page 47, the draft passing through the fire in a horizontal direction. The thickness of the fuel bed is therefore invariable, being always equal to the width of the magazine from front to back, and hence the draft conditions are constant. No matter how heavy a charge of fuel is put in, it cannot temporarily smother the fire, as in a surface fired boiler.

*Smokeless Combustion*—The fuel feeds automatically down into the fire at a constant rate. As the draft is constant, the proportions of fuel and air are always correct for complete combustion, and SMOKELESS combustion is only another name for COMPLETE combustion.

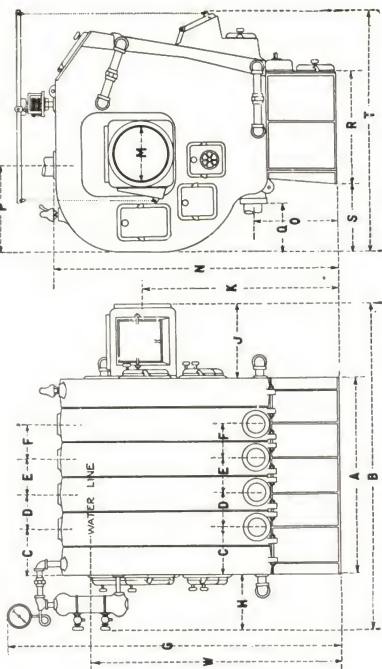
# The Pierce Downdraft Boilers

## DIMENSION TABLES

Dimensions That Are Special for Each Size

No. of Boiler	A	B*	C	D	E	F
844	26¾	55¼	9¾	7¼		
845	34	62½	9¾	14⅝		
846	41¼	69¾	9¾	21⅞		
847	48½	77	9¾	14⅝	14⅝	
848	55¾	83	9¾	21⅞	14⅝	
849	63	90¼	9¾	21⅞	21⅞	
8410	70¼	97½	9¾	29¼	21⅞	21⅞
8411	77½	104¾	9¾	21⅞	14⅝	21⅞
8412	84¾	112	9¾	21⅞	14⅝	21⅞

\*Dimensions are for Steam Boilers. On account of having no water column, length over all (B) and clearance (H), for Water Boilers, are 7 inches less.



Dimensions That Are Common to All Sizes

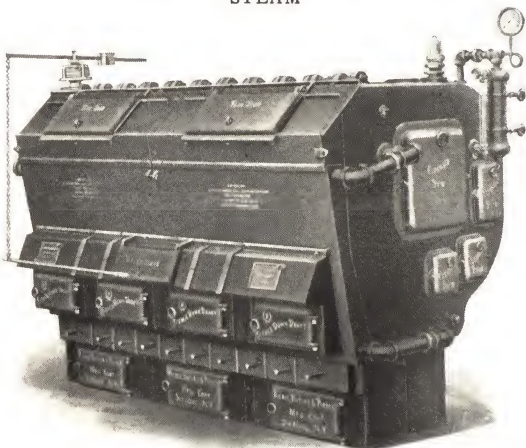
All Dimensions Are Given in Inches

G	H*	J†	K	M†	N	O	P	Q	R	S	T
73	11	16¾	42½	10	61¼	18	19	10½	23	15	47

†On sizes 848 and larger J is 15½ inches and M is 12 inches. Height of water line on all sizes of Steam Boilers is 54 inches.

# The Pierce Down Draft Boiler

STEAM



Number	†Ratings Sq. Ft.	No. Sec- tions	Founda- tion Length Ins.	Size Smoke Pipe Ins.	Flow and Return Outlets Ins.	Chimney Flue Ins.
S 844 B	900	4	26¾	10	2-4	12x12
S 845 B	1250	5	34	10	2-4	12x12
S 846 B	1600	6	41¼	10	2-4	12x16
S 847 B	1950	7	48½	10	3-4	16x16
S 848 B	2350	8	55¾	12	3-4	16x16
S 849 B	2800	9	63	12	3-4	16x20
S 8410 B	3300	10	70¼	12	3-4	16x20
S 8411 B	3800	11	77½	12	4-4	20x20
S 8412 B	4300	12	84¾	12	4-4	20x20

Maximum length of boiler 47 inches.

\* See diagram, page 47, for detail dimensions.

Height to top of outlet, 61¼ inches.

Height of water line, 54 inches.

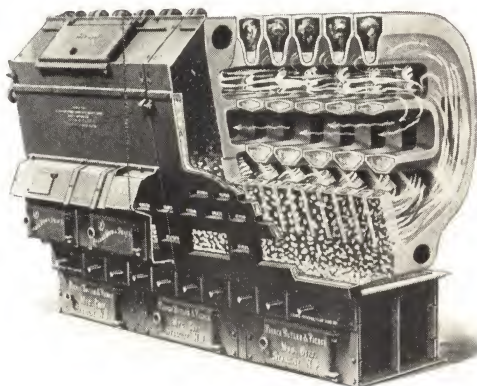
Safety valve sizes comply with A. S. M. E. boiler code.

Repairs for boilers are listed on pages 269-272.

† See note regarding ratings, page 9.

# The Pierce Down Draft Boiler

## WATER



Number	† Ratings Sq. Ft.	No. Sec- tions	Founda- tion Length Ins.	Size Smoke Pipe Ins.	Flow and Return Outlets Ins.	Chimney Flue Ins.
W 844 B	1500	4	26¾	10	2-4	12x12
W 845 B	2050	5	34	10	2-4	12x12
W 846 B	2650	6	41¼	10	2-4	12x16
W 847 B	3200	7	48½	10	3-4	16x16
W 848 B	3900	8	55¾	12	3-4	16x16
W 849 B	4625	9	63	12	3-4	16x20
W 8410 B	5450	10	70¼	12	3-4	16x20
W 8411 B	6275	11	77½	12	4-4	20x20
W 8412 B	7100	12	84¾	12	4-4	20x20

Maximum width of boiler, 47 inches.

Height to top outlet, 61¼ inches.

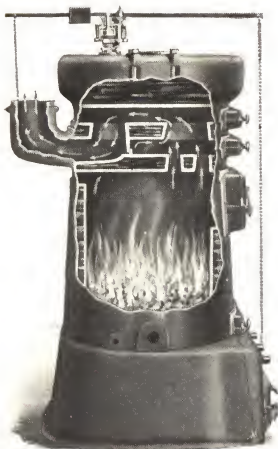
See diagram, page 47, for detail dimensions.

Repairs for boiler are listed on pages 269-272.

† See note regarding ratings, page 9.

# The Pebco Boiler

STEAM AND HOT WATER



This is a round boiler which embodies some very distinctive features among which are the following:

The Pebco boiler has an unusually deep fire pot which not only permits firing periods of 12 hours or more, but insures more perfect combustion and uniform heat.

Its grates are triangular and revolving, and, by distributing the wear over three surfaces, the life is three-fold.

The finger bars are perpendicular (not horizontal) and, as such, do not allow an accumulation of ash since the entire diameter of the fire pot is shaken.

The gas travel is much longer than in other makes of round boilers and, by its revertible action insures dry steam at all times as well as a higher efficiency than is usual with low rates of combustion.

The low smoke hood possible with this arrangement materially reduces the fire hazard by increasing the normal distance from overhead woodwork.



# The Pierce Pebco Boiler

FOR HARD OR SOFT COAL

STEAM



No. S-944

WATER



No. W-944

# Pierce "Pebco" Steam Boiler

## For Hard or Soft Coal, Gas or Oil Fuels

**Series 3**      Assemblage: Base, Firepot, One Intermediate Section, and Dome.

No.	Rating Sq. Ft.	Inside Diam. Firepot Ins.	Grate Area Sq. Ft.	Outlets and Inlets	Coal Capacity Lbs.	Water Line Ins.	Height to Top Outlet Ins.
S 913	325	17	1.57	2-2½	125	44⅝	50⅛
S 923	425	19	1.97	2-2½	147	47¼	53⅜
S 933	500	21½	2.52	2-3	193	47⅛	53⅝
S 943	650	25	3.27	2-3	255	48⅜	54¾
S 953	900	28	4.27	2-4	335	48⅞	55¼
S 963	1250	31	5.24	2-4	395	50	56¾

**Series 4**      Assemblage: Base, Firepot, Two Intermediate Sections, and Dome.

S 914	375	17	1.57	2-2½	125	49⅛	54⅝
S 924	475	19	1.97	2-2½	147	51⅞	54⅞
S 934	550	21½	2.52	2-3	193	51⅝	58⅛
S 944	725	25	3.27	2-3	255	52¾	59⅞
S 954	1000	28	4.27	2-4	335	53¼	59⅝
S 964	1400	31	5.24	2-4	395	53	61¾

**Series 5**      Assemblage: Base, Firepot, Three Intermediate Sections, and Dome.

S 935	600	21½	2.52	2-3	193	56⅛	62⅝
S 945	800	25	3.27	2-3	255	56⅞	63¼
S 955	1100	28	4.27	2-4	335	57⅜	64
S 965	1550	31	5.24	2-4	395	60	66¾

See notes regarding ratings on pages 8-9.  
Repairs for above boilers are listed on page 281.

### Chimney Sizes

No.	Min. Hgt. Ft.	Min. Flue Size	No.	Min. Hgt. Ft.	Min. Flue Size	No.	Min. Hgt. Ft.	Min. Flue Size
S913	30	8"x 8"	S914	30	8"x 8"	S935	35	8"x12"
S923	30	8"x 8"	S924	30	8"x 8"	S945	40	8"x12"
S933	35	8"x12"	S934	35	8"x12"	S955	45	12"x12"
S943	35	8"x12"	S944	35	8"x12"	S965	50	12"x12"
S953	35	8"x12"	S954	35	8"x12"			
S963	35	12"x12"	S964	35	12"x12"			

**NOTE:** The above sizes are based upon the use of stove size anthracite coal of best quality and if other than this is used the chimney must be increased correspondingly. Also 2% must be added to area of flue for each 500 feet above sea level.

# Pierce "Pebco" Water Boiler

For Hard or Soft Coal, Gas or Oil Fuels

**Series 3** Assemblage: Base, Firepot, One Intermediate Section, and Dome.

No.	Rating Sq. Ft.	Inside Diam. Firepot Ins.	Grate Area Sq. Ft.	Outlets and Inlets	Coal Capacity Lbs.	Height to Top Outlet Ins.
W 913	525	17	1.57	2-2½	125	47¾
W 923	675	19	1.97	2-2½	147	51
W 933	825	21½	2.52	2-3	193	51¾
W 943	1075	25	3.27	2-3	255	52
W 953	1500	28	4.27	2-4	335	52½
W 963	2000	31	5.24	2-4	395	53¾

**Series 4** Assemblage: Base, Firepot, Two Intermediate Sections, and Dome.

W 914	600	17	1.57	2-2½	125	52¼
W 924	800	19	1.97	2-2½	145	55½
W 934	925	21½	2.52	2-3	193	55¾
W 944	1200	25	3.27	2-3	255	56½
W 954	1650	28	4.27	2-4	335	56¾
W 964	2250	31	5.24	2-4	395	58¾

**Series 5** Assemblage: Base, Firepot, Three Intermediate Sections, and Dome.

W 935	1000	21½	2.52	2-3	193	60¼
W 945	1325	25	3.27	2-3	255	60¾
W 955	1800	28	4.27	2-4	335	61¼
W 965	2500	31	5.24	2-4	395	63¾

See notes regarding ratings on pages 8 and 9.  
Repairs for above boilers are listed on page 281.

## Chimney Sizes

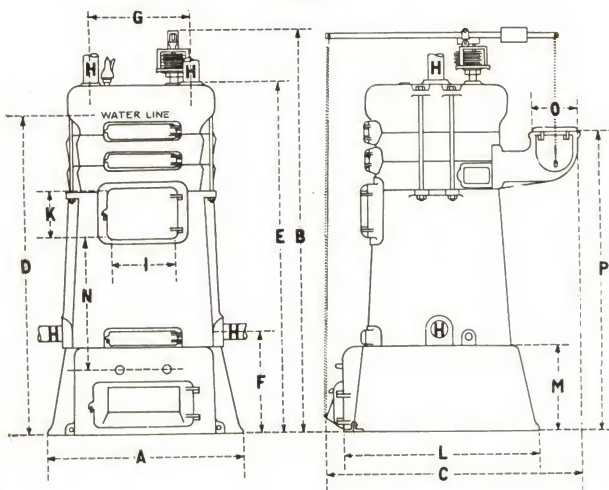
No.	Min. Hgt. Ft.	Min. Flue Size	No.	Min. Hgt. Ft.	Min. Flue Size	No.	Min. Hgt. Ft.	Min. Flue Size
W913	30	8"x 8"	W914	30	8"x 8"	W935	35	8"x12"
W923	30	8"x 8"	W924	30	8"x 8"	W945	40	8"x12"
W933	35	8"x12"	W934	35	8"x12"	W955	45	12"x12"
W943	35	8"x12"	W944	35	8"x12"	W965	50	12"x12"
W953	35	8"x12"	W954	35	8"x12"			
W963	35	12"x12"	W964	35	12"x12"			

NOTE: The above sizes are based upon the use of stove size anthracite coal of best quality, and if other than this is used the chimney must be increased correspondingly. Also 2% must be added to area of each flue for each 500 feet above sea level.

# The Pierce Pebco Boiler

## DIMENSION TABLES

### STEAM



For Dimensions I to R see page 53

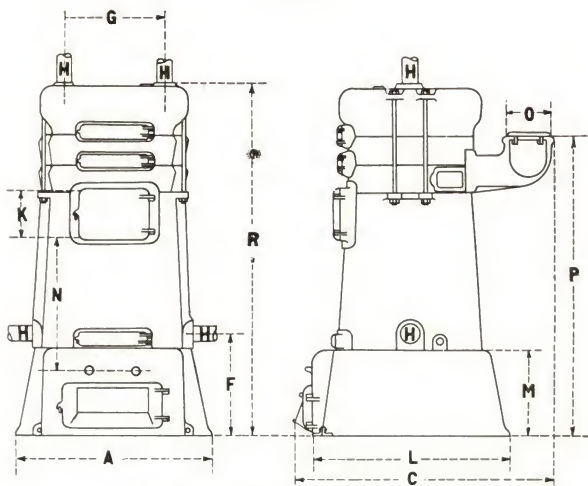
Number	A	B	C	D	E	F	G	H
S913	25 $\frac{3}{4}$	58 $\frac{5}{8}$	34 $\frac{1}{2}$	44 $\frac{5}{8}$	50 $\frac{1}{8}$	15 $\frac{1}{4}$	14 $\frac{1}{2}$	21 $\frac{1}{2}$
S914	25 $\frac{3}{4}$	63 $\frac{1}{8}$	34 $\frac{1}{2}$	49 $\frac{1}{8}$	54 $\frac{5}{8}$	15 $\frac{1}{4}$	14 $\frac{1}{2}$	21 $\frac{1}{2}$
S923	29	61 $\frac{7}{8}$	39 $\frac{1}{2}$	47 $\frac{1}{4}$	53 $\frac{3}{8}$	16	16 $\frac{1}{8}$	21 $\frac{1}{2}$
S9-4	29	66 $\frac{3}{8}$	39 $\frac{1}{2}$	51 $\frac{7}{8}$	57 $\frac{7}{8}$	16	16 $\frac{1}{8}$	21 $\frac{1}{2}$
S933	31 $\frac{1}{2}$	62 $\frac{1}{8}$	43	47 $\frac{1}{8}$	53 $\frac{5}{8}$	16 $\frac{3}{8}$	19 $\frac{3}{8}$	3
S934	31 $\frac{1}{2}$	66 $\frac{5}{8}$	43	51 $\frac{5}{8}$	58 $\frac{1}{8}$	16 $\frac{3}{8}$	19 $\frac{3}{8}$	3
S935	31 $\frac{1}{2}$	71 $\frac{1}{2}$	43	56 $\frac{1}{8}$	62 $\frac{3}{8}$	16 $\frac{3}{8}$	19 $\frac{3}{8}$	3
S943	34 $\frac{1}{2}$	63 $\frac{1}{4}$	46	48 $\frac{3}{8}$	54 $\frac{3}{4}$	17	22 $\frac{1}{2}$	3
S944	34 $\frac{1}{2}$	67 $\frac{5}{8}$	46	52 $\frac{3}{4}$	59 $\frac{1}{8}$	17	22 $\frac{1}{2}$	3
S945	34 $\frac{1}{2}$	71 $\frac{3}{4}$	46	56 $\frac{7}{8}$	63 $\frac{1}{4}$	17	22 $\frac{1}{2}$	3
S953	38	63 $\frac{3}{4}$	49 $\frac{1}{2}$	48 $\frac{7}{8}$	55 $\frac{1}{4}$	18 $\frac{1}{4}$	25 $\frac{3}{4}$	4
S954	38	68 $\frac{1}{8}$	49 $\frac{1}{2}$	53 $\frac{1}{4}$	59 $\frac{5}{8}$	18 $\frac{1}{4}$	25 $\frac{3}{4}$	4
S955	38	72 $\frac{1}{2}$	49 $\frac{1}{2}$	57 $\frac{3}{8}$	64	18 $\frac{1}{4}$	25 $\frac{3}{4}$	4
S963	41 $\frac{1}{4}$	66 $\frac{3}{4}$	53 $\frac{1}{2}$	50	56 $\frac{3}{4}$	18 $\frac{5}{8}$	29	4
S964	41 $\frac{1}{4}$	71 $\frac{3}{4}$	53 $\frac{1}{2}$	55	61 $\frac{3}{4}$	18 $\frac{5}{8}$	29	4
S965	41 $\frac{1}{4}$	76 $\frac{3}{4}$	53 $\frac{1}{2}$	60	66 $\frac{3}{4}$	18 $\frac{5}{8}$	29	4

Dimensions are in inches.

# The Pierce Pebco Boiler

## DIMENSION TABLES

### WATER



For Dimensions A to H see page 52

I	K	L	M	N	O	P	R	Number
9½	7½	26¾	12⅞	17⅝	7	45⅜	47¾	W913
9½	7½	26¾	12⅞	17⅝	7	45⅜	52¼	W914
10½	8½	29¾	13½	19½	7	47⅝	51	W923
10½	8½	29¾	13½	19½	7	47⅝	55½	W924
12	8½	31½	13⅞	19¼	8	48⅞	51¼	W933
12	8½	31½	13⅞	19¼	8	48⅞	55¾	W934
12	8½	31½	13⅞	19¼	8	48⅞	60¼	W935
12	8½	34½	14½	19½	9	51⅝	52	W943
12	8½	34½	14½	19½	9	51⅝	56½	W944
12	8½	34½	14½	19½	9	51⅝	60¾	W945
12	8½	38	15	19½	9	52⅞	52½	W953
12	8½	38	15	19½	9	52⅞	56¾	W954
12	8½	38	15	19½	9	52⅞	61¼	W955
12	8½	42	15¼	19½	10	51¼	53¾	W963
12	8½	42	15¼	19½	10	51¼	58¾	W964
12	8½	42	15¼	19½	10	51¼	63¾	W965

Dimensions are in inches.



# Pierce Hot Water Supply Boilers

## SERIES 1000—FLAT TOP



### FOR HARD OR SOFT COAL

No.	*Radiation Sq. Ft.	Tank Capacity Gals.	Diam. Grate Ins.	Area of Grate Sq. Ft.	Inlets & Outlets Ins.	Diam. Smoke Pipe Ins.
1010	65	100	10	.54	2	5
1012	130	200	12	.78	2	6
1015	260	400	15	1.22	2½	6

In selecting a boiler to overcome heat loss, it is well to have at least 50 per cent greater rating than gallons to be heated.

\*See note regarding ratings, page 9.

Brass water sections can be furnished for these boilers; prices on application.

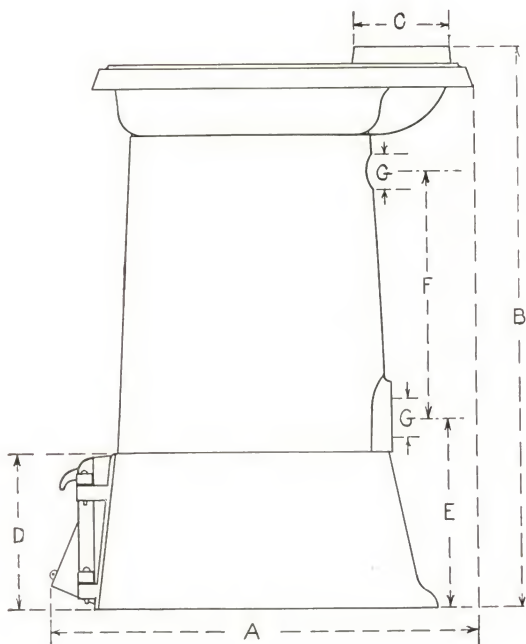
Diameter of lid, 8 inches.

Repairs for boilers are listed on page 296.

# Pierce Hot Water Supply Boilers

SERIES 1000—FLAT TOP

DIMENSION TABLE



No.	A	B	C	D	E	F	G
1010	22	28	5	8	9 $\frac{3}{4}$	11	2
1012	24	30	6	8 $\frac{1}{2}$	10 $\frac{1}{4}$	12 $\frac{3}{4}$	2
1015	25 $\frac{3}{4}$	32	6	9	11 $\frac{1}{4}$	13 $\frac{1}{4}$	2 $\frac{1}{2}$

All dimensions are given in inches.

# Pierce Hot Water Supply Boilers

SERIES 1100—DOME TOP



## FOR HARD OR SOFT COAL

No.	*Radiation Sq. Ft.	Tank Capacity Gals.	Diam. Grate Ins.	Area of Grate Sq. Ft.	Inlets & Outlets Ins.	Diam. Smoke Pipe Ins.
1110	100	150	10	.54	2	5
1112	200	300	12	.78	2	6
1115	325	500	15	1.22	2½	6
1117	425	650	17	1.57	2½	7
1119	525	800	19	1.97	2½	7
1122	650	1000	21½	2.52	3	8

In selecting a boiler to overcome heat loss, it is well to have at least 50 per cent greater rating than gallons to be heated.

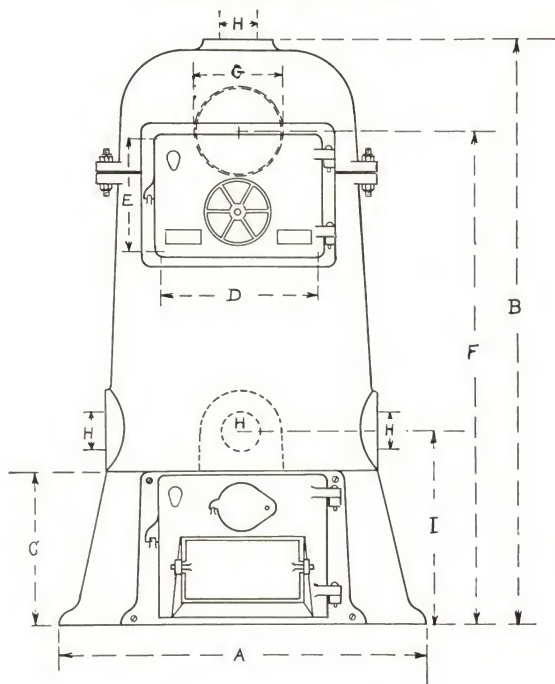
\*See note regarding ratings, page 9.

Brass water sections can be furnished for these boilers; prices on application.

Repairs for above boilers are listed on page 296.

# Pierce Hot Water Supply Boilers

SERIES 1100—DOME TOP



DIMENSION TABLE

No.	A	B	C	D	E	F	G	H	I
1110	18½	30½	8	8	6	25½	5	2	9¾
1112	20¾	33½	8½	9	7	28	6	2	10¾
1115	24¾	25¾	9	10	8	30	6	2½	11¼
1117*	25¾	45¼	13	9½	7½	38¾	7	2½	15¼
1119*	29	48¾	13½	10½	8½	42	7	2½	16
1122*	31½	49¾	14	12	8½	42¾	8	3	16½

All dimensions are given in inches.

\*Nos. 1117, 1119 and 1122 have two return tapplings, one at either side. All other sizes have a single return tapping in the rear.

## Pierce Little Giant Laundry Boilers



Little Giant Low-Leg



Little Giant High-Leg

### LOW-LEG TYPE

No.	*Tank Capacity Gals.	Height Boiler Ins.	Diam. Grate Ins.	No. and Size Outlets Ins.	No. and Size Returns Ins.	Diam. Smoke Pipe Ins.
111	50	25 $\frac{3}{4}$	12	1-1	1-1	6
123	85	25 $\frac{3}{4}$	12	1-1	1-1	6
101	125	25 $\frac{3}{4}$	12	1-1 $\frac{1}{4}$	1-1 $\frac{1}{4}$	6
112	225	26 $\frac{1}{4}$	16	1-1 $\frac{1}{2}$	1-1 $\frac{1}{2}$	6

Diameter each lid, 9 $\frac{3}{8}$  inches.

Maximum dimensions of opening with lids removed, 20 $\frac{1}{4}$ x10 inches.

### HIGH-LEG TYPE

8	40	23 $\frac{1}{4}$	8	1-1	1-1	6
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Diameter each lid, 7 $\frac{1}{8}$  inches.

Maximum dimensions of opening with lids removed, 16 $\frac{1}{4}$ x7 $\frac{5}{8}$  inches.

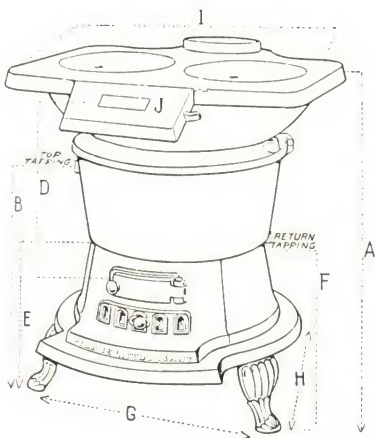
\*See note regarding ratings, page 9.

Repairs for above boilers are listed on page 297.



# Pierce Little Giant Laundry Boilers

## Dimension Tables



### LOW-LEG TYPE

No.	A	B	D	E	F	G	H	J	I
111	25 $\frac{3}{4}$	17 $\frac{1}{2}$	14	12	14	21	25 $\frac{1}{4}$	8 x4	24
123	25 $\frac{3}{4}$	17 $\frac{1}{2}$	14	12	14	21	25 $\frac{1}{4}$	8 x4	24
101	25 $\frac{3}{4}$	18	14	12	14	21	25 $\frac{1}{2}$	8 x4	24
112	26 $\frac{1}{4}$	18 $\frac{1}{4}$	14	12	15 $\frac{1}{4}$	26	30	9 $\frac{1}{2}$ x5	28

### HIGH-LEG TYPE

No.	A	B	D	E	F	G	H	J	I
8	23 $\frac{1}{4}$	17 $\frac{3}{4}$	11	12 $\frac{1}{2}$	13 $\frac{1}{2}$	18	20 $\frac{3}{4}$	9 x4	21 $\frac{1}{2}$

## Pierce Domestic Water Boilers

The various conditions and uses for which Pierce Little Giant Heaters have been installed are so numerous, both for atmospheric and tank heating, that space prohibits our listing below but a few of the more common.

As a tank boiler for furnishing hot water.

Bath Rooms	Garages
Bath Houses	Hotels
Barber Shops	Kitchens
Barns	Laundries
Bottling Works	Lavatories
Bill Posting	Laboratories
Baptisteries	Liquid Vats
Carriage Houses	Milk Depots
Carving Tables in Restaurants	Natatoria
Circus Cars	Paint Tanks
Cleaning Concerns	Pantries
Clubs	Poultry Houses
Dyeing Establishments	R. R. Water Tanks
Dairy Buildings	Roof Storage Tanks
Drug Stores	Restaurants
Farm Buildings	Stock Fodder Mixing
Fire Extinguisher Tanks	Toilets
Fish Hatcheries	Washstands
Fire Engine Houses	Wash Tubs
Factories	Water Works Building

As a hot water boiler for heating enclosures with radiation.

As an Auxiliary Heater	Hunting Lodges
Acetylene Gas Houses	Offices
Barns	Platform Stations
Billiard Rooms	R. R. Switch Towers
Bowling Alleys	R. R. Fruit Cars
Chicken Brooders	R. R. Stations
Cottages	Seaside Cottages
Chicken Hatcheries	Small Stores
Forcing Houses	Storage Rooms
Fruit Dryers	Vegetable Storehouses
Fishing Lodges	Ventilating Ducts
Garages	Weighing Rooms
Golf Clubs	Yacht Clubs
Green Houses	

## Directions for Ordering Radiators

You can assist us very materially in handling your order by following, as closely as possible, the directions here given:

1. Write legibly and, if convenient, order on type-written sheet.

2. Give the exact name of the radiator as it appears in this catalogue.

3. Be particular about giving clearly the number of radiators and the number of sections in each radiator.

4. Give the heights wanted, and state whether for steam, vapor or water heating.

5. State, if for steam, whether for one or two-pipe work.

6. When leg sections are ordered, give name of the radiator, the tapping desired, whether for supply or return connection, whether for one or two-pipe steam or for hot water, and whether for top or bottom connection.

7. In case radiators for hot water are ordered tapped top and bottom, state whether the tapping should be at the same or opposite ends.

8. Special patterns, shapes, and tappings frequently cause delay; we suggest, therefore, the use of standard patterns, shapes and tappings.

9. List of sizes and heating surfaces of sections are shown on following pages.

10. Radiators of unusual length are very apt to become strained in transportation and for this reason it is suggested that the use of long radiators be avoided so far as possible and when necessary order all lengths of 32 sections or over to be shipped in halves.

# Pierce One-Column Radiator

For Steam and Water



Width of section and outside width of legs,  
 $4\frac{1}{2}$  inches.

See note regarding tappings on page 78.

# Pierce One-Column Radiator

## For Steam and Water

Number of Sections	Length, 2½" per Section	HEATING SURFACE, SQUARE FEET				
		38" high 3 sq. ft. per Sec.	32" high 2½ sq. ft. per Sec.	26" high 2 sq. ft. per Sec.	23" high 1¾ sq. ft. per Sec.	20" high 1½ sq. ft. per Sec.
2	5	6	5	4	3⅓	3
3	7½	9	7½	6	5	4½
4	10	12	10	8	6⅔	6
5	12½	15	12½	10	8⅓	7½
6	15	18	15	12	10	9
7	17½	21	17½	14	11⅔	10½
8	20	24	20	16	13⅓	12
9	22½	27	22½	18	15	13½
10	25	30	25	20	16⅔	15
11	27½	33	27½	22	18⅓	16½
12	30	36	30	24	20	18
13	32½	39	32½	26	21⅔	19½
14	35	42	35	28	23⅓	21
15	37½	45	37½	30	25	22½
16	40	48	40	32	26⅔	24
17	42½	51	42½	34	28⅓	25½
18	45	54	45	36	30	27
19	47½	57	47½	38	31⅔	28½
20	50	60	50	40	33⅓	30
21	52½	63	52½	42	35	31½
22	55	66	55	44	36⅔	33
23	57½	69	57½	46	38⅓	34½
24	60	72	60	48	40	36
25	62½	75	62½	50	41⅔	37½
26	65	78	65	52	43⅓	39
27	67½	81	67½	54	45	40½
28	70	84	70	56	46⅔	42
29	72½	87	72½	58	48⅓	43½
30	75	90	75	60	50	45
31	77½	93	77½	62	51⅔	46½
32	80	96	80	64	53⅓	48

All radiators are regularly tapped 1½ inches right-hand and bushed according to tapping list.

When top tapping is required it can be furnished 1½ inches and bushed any size smaller.

Air vent tappings are regularly made ⅛ inch. Add ¾ inch for each bushing or plug to get total length measurement of radiator.

## Pierce Two-Column Radiator

For Steam and Water



Width of section and outside width of legs,  
7½ inches.

See note regarding tappings on page 78.



# Pierce Two-Column Radiator

## For Steam and Water

Number of Sections	Length, 2½" per Section	HEATING SURFACE, SQUARE FEET					
		45"high 5 sq.ft. per Sec.	38"high 4 sq.ft. per Sec.	32"high 3½sq.ft. per Sec.	26"high 2½sq.ft. per Sec.	23"high 2½sq.ft. per Sec.	20"high 2 sq.ft. per Sec.
2	5	10	8	6⅔	5⅓	4⅔	4
3	7½	15	12	10	8	7	6
4	10	20	16	13⅓	10⅔	9⅓	8
5	12½	25	20	16⅔	13⅓	11⅔	10
6	15	30	24	20	16	14	12
7	17½	35	28	23⅓	18⅔	16⅓	14
8	20	40	32	26⅔	21⅓	18⅔	16
9	22½	45	36	30	24	21	18
10	25	50	40	33⅓	26⅔	23⅓	20
11	27½	55	44	36⅔	29⅓	25⅔	22
12	30	60	48	40	32	28	24
13	32½	65	52	43⅓	34⅔	30⅓	26
14	35	70	56	46⅔	37⅓	32⅔	28
15	37½	75	60	50	40	35	30
16	40	80	64	53⅓	42⅔	37⅓	32
17	42½	85	68	56⅔	45⅓	39⅔	34
18	45	90	72	60	48	42	36
19	47½	95	76	63⅓	50⅔	44⅓	38
20	50	100	80	66⅔	53⅓	46⅔	40
21	52½	105	84	70	56	49	42
22	55	110	88	73⅓	58⅔	51⅓	44
23	57½	115	92	76⅔	61⅓	53⅔	46
24	60	120	96	80	64	56	48
25	62½	125	100	83⅓	66⅔	58⅓	50
26	65	130	104	86⅔	69⅓	60⅔	52
27	67½	135	108	90	72	63	54
28	70	140	112	93⅓	74⅔	65⅓	56
29	72½	145	116	96⅔	77⅓	67⅔	58
30	75	150	120	100	80	70	60
31	77½	155	124	103⅓	82⅔	72⅓	62
32	80	160	128	106⅔	85⅓	74⅔	64

All radiators are regularly tapped 2 inches right-hand and bushed according to tapping list.

When top tapping is required it can be furnished 1½ inches and bushed any size smaller.

Air vent tappings are regularly made ⅛ inch.

Add ¾ inch for each bushing or plug to get total length measurement of radiator.

## Pierce Three-Column Radiator

For Steam and Water



Width of section and outside width of legs,  
9 inches.

See note regarding tappings on page 78.

# Pierce Three-Column Radiator

## For Steam and Water

Number of Sections	Length, 2½" per Section	HEATING SURFACE, SQUARE FEET					
		45"high 6 sq.ft. per Sec.	38"high 5 sq. ft. per Sec.	32"high 4½sq.ft. per Sec.	26"high 3¾sq.ft. per Sec.	22"high 3 sq.ft. per Sec.	18"high 2¼sq.ft. per Sec.
2	5	12	10	9	7½	6	4½
3	7½	18	15	13½	11¼	9	6¾
4	10	24	20	18	15	12	9
5	12½	30	25	22½	18¾	15	11¼
6	15	36	30	27	22½	18	13½
7	17½	42	35	31½	26¼	21	15¾
8	20	48	40	36	30	24	18
9	22½	54	45	40½	33¾	27	20¼
10	25	60	50	45	37½	30	22½
11	27½	66	55	49½	41¼	33	24¾
12	30	72	60	54	45	36	27
13	32½	78	65	58½	48¾	39	29¼
14	35	84	70	63	52½	42	31½
15	37½	90	75	67½	56¼	45	33¾
16	40	96	80	72	60	48	36
17	42½	102	85	76½	63¾	51	38¼
18	45	108	90	81	67½	54	40½
19	47½	114	95	85½	71¼	57	42¾
20	50	120	100	90	75	60	45
21	52½	126	105	94½	78¾	63	47¼
22	55	132	110	99	82½	66	49½
23	57½	138	115	103½	86¼	69	51¾
24	60	144	120	108	90	72	54
25	62½	150	125	112½	93¾	75	56¼
26	65	156	130	117	97½	78	58½
27	67½	162	135	121½	101¼	81	60¾
28	70	168	140	126	105	84	63
29	72½	174	145	130½	108¾	87	65¼
30	75	180	150	135	112½	90	67½
31	77½	186	155	139½	116¼	93	69¾
32	80	192	160	144	120	96	72

All radiators are regularly tapped 2 inches right-hand and bushed according to tapping list.

When top tapping is required it can be furnished 1½ inches and bushed any size smaller.

Air vent tapplings are regularly made ½ inch.

Add ¾ inch for each bushing or plug to get total length measurement of radiator.

## Pierce Four-Column Radiator

For Steam and Water



Width of section and outside width of legs,  
 $11\frac{1}{8}$  inches.

See note regarding tappings on page 79.

# Pierce Four-Column Radiator

## For Steam and Water

Number of Sections	Length, 3" per Section	HEATING SURFACE, SQUARE FEET					
		45"high 10sq.ft. per Sec.	38"high 8 sq.ft. per Sec.	32"high 6½sq.ft. per Sec.	26"high 5 sq.ft. per Sec.	22"high 4 sq. ft. per Sec.	18"high 3 sq.ft. per Sec.
2	6	20	16	13	10	8	6
3	9	30	24	19½	15	12	9
4	12	40	32	26	20	16	12
5	15	50	40	32½	25	20	15
6	18	60	48	39	30	24	18
7	21	70	56	45½	35	28	21
8	24	80	64	52	40	32	24
9	27	90	72	58½	45	36	27
10	30	100	80	65	50	40	30
11	33	110	88	71½	55	44	33
12	36	120	96	78	60	48	36
13	39	130	104	84½	65	52	39
14	42	140	112	91	70	56	42
15	45	150	120	97½	75	60	45
16	48	160	128	104	80	64	48
17	51	170	136	110½	85	68	51
18	54	180	144	117	90	72	54
19	57	190	152	123½	95	76	57
20	60	200	160	130	100	80	60
21	63	210	168	136½	105	84	63
22	66	220	176	143	110	88	66
23	69	230	184	149½	115	92	69
24	72	240	192	156	120	96	72
25	75	250	200	162½	125	100	75
26	78	260	208	169	130	104	78
27	81	270	216	175½	135	108	81
28	84	280	224	182	140	112	84
29	87	290	232	188½	145	116	87
30	90	300	240	195	150	120	90
31	93	310	248	201½	155	124	93
32	96	320	256	208	160	128	96

All radiators are regularly tapped 2 inches right-hand and bushed according to tapping list.

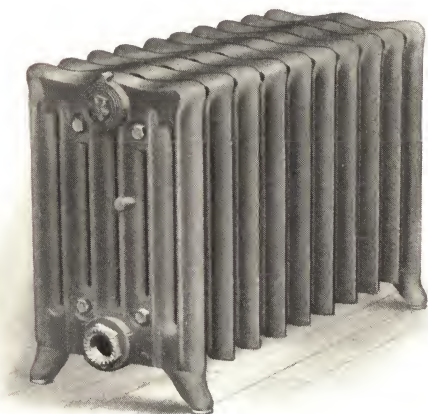
When top tapping is required it can be furnished 1½ inches and bushed any size smaller.

Air vent tappings are regularly made ⅜ inch.

Add ¾ inch for each bushing or plug to get total length measurement of radiator.

## Pierce Window Radiator

For Steam and Water



Width of section and outside width of legs,  
13 inches.

See note regarding tappings on page 79.



# Pierce Window Radiator

## For Steam and Water

Number of Sections	Length, 3" per Section	HEATING SURFACE, SQUARE FEET				
		20" high 5 sq. ft. per Sec.	18" high 4½ sq. ft. per Sec.	16" high 3¾ sq. ft. per Sec.	14" high 3 sq. ft. per Sec.	13" high 3 sq. ft. per Sec.
2	6	10	8⅔	7½	6	6
3	9	15	13	11¼	9	9
4	12	20	17⅓	15	12	12
5	15	25	21⅔	18¾	15	15
6	18	30	26	22½	18	18
7	21	35	30⅓	26¼	21	21
8	24	40	34⅔	30	24	24
9	27	45	39	33¾	27	27
10	30	50	43⅓	37½	30	30
11	33	55	47⅔	41¼	33	33
12	36	60	52	45	36	36
13	39	65	56⅓	48¾	39	39
14	42	70	60⅔	52½	42	42
15	45	75	65	56¼	45	45
16	48	80	69⅓	60	48	48
17	51	85	73⅔	63¾	51	51
18	54	90	78	67½	54	54
19	57	95	82⅓	71¼	57	57
20	60	100	86⅔	75	60	60
21	63	105	91	78¾	63	63
22	66	110	95⅓	82½	66	66
23	69	115	99⅔	86¼	69	69
24	72	120	104	90	72	72
25	75	125	108⅓	93¾	75	75
26	78	130	112⅔	97½	78	78
27	81	135	117	101¼	81	81
28	84	140	121⅓	105	84	84
29	87	145	125⅔	108¾	87	87
30	90	150	130	112½	90	90
31	93	155	134⅓	116¼	93	93
32	96	160	138⅔	120	96	96

All radiators will be tapped 1½ inches and bushed according to the tapping list. When top tapping is desired it can be furnished tapped 1½ inches and bushed to order, from factory.

All openings will be right-hand threaded, unless otherwise ordered.

Air valve tappings are regularly made ⅛ inch.

Add ¾ inch for each bushing to get total length measurement of radiator.

# Pierce Hospital Radiator

STEAM AND WATER

Furnished in Two-Column Only



Designed especially for hospitals. Has extra wide air space between sections, which permits easy cleaning. Bottom tie rod may be located above lower hubs if so specified.

Width of section and outside width of legs,  $7\frac{1}{2}$  inches. Distance between centers, 3 inches.

For heating surface, see page 64.

## Pierce Extra Heavy Malleable Iron Push Nipples



Extra heavy malleable iron push nipples are used in connecting the sections of Pierce Column Radiators. These nipples are made of the best material, machined in a lathe and guaranteed to make a perfect joint. They have stood the acid test and are corrosion proof. One need have no apprehension as to their lasting qualities. Push nipple joints are easily taken apart and put together again, which is a distinct advantage in raising heavy radiators to upper stories or across finished floors.

## Pierce Legless Radiators

With Concealed Brackets



The Pierce Legless Radiator is an adaptation of the Pierce one, two, three and four-column radiators as shown on the preceding pages.

For list of heights and heating surface see lists on the one, two, three and four-column radiators.

## Pierce High-Leg Radiators



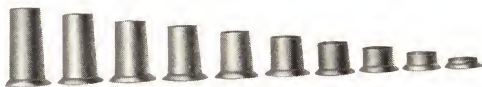
"Pierce" one, two, three and four-column radiators can be furnished with special length of legs, of improved construction. This form of special high leg is much stronger and neater than ordinary types since these leg sections are cast in one piece.

Made in special heights as follows: 6, 6½, 7, 7½, 8, 8½, 9, 9½ inches from floor to center of openings.

An extra charge is made for lower or higher legs than regularly shown.

## Pierce Radiator Pedestals

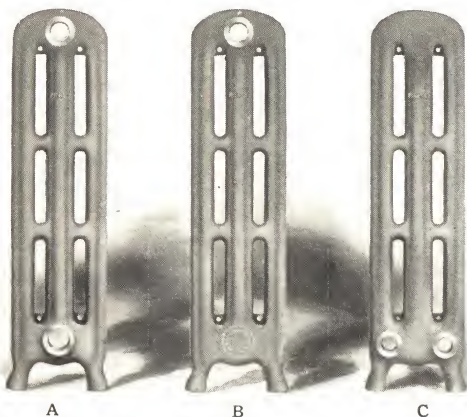
To meet the demand for a substantial pedestal we present the series of "Pierce" Radiator Pedestals shown below.



They are made of cast iron, and can be finished like the radiators so that they do not attract critical attention when installed. They can be used with any radiator made.

Height, inches..½ 1 1½ 2 2½ 3 3½ 4 4½ 5

## Pierce Special Radiator Tappings



- A—Radiator is tapped top and bottom, same end.  
 B—Radiator is tapped top and bottom, opposite ends.  
 C—Radiator is tapped supply and return same end.

In changing the location of, or providing for solid tappings, or for additional tappings, an extra charge per tapping will be made.

On radiators ordered with double hub tapping, shown in "C" radiator above, an extra charge will be made per radiator.

Pierce Radiators can be tapped top and bottom same end or top and bottom opposite ends, as shown above.

We give below measurements in inches from center of top tapping to floor.

Height	1 Col.	2 Col.	3 Col.	4 Col.
45 in.	—	42 1/2	42 1/2	42 1/2
38 in.	35 1/2	35 1/2	35 1/2	35 1/2
32 in.	29 1/2	29 1/2	29 1/2	29 1/2
26 in.	23 1/2	23 1/2	23 1/2	23 1/2
23 in.	20 1/2	20 1/2	—	—
22 in.	—	—	19 1/2	19 1/2
20 in.	17 1/2	17 1/2	—	—
18 in.	—	—	15 1/2	15 1/2



# Pierce Standard Radiator Tappings

## Steam Radiators

### One-Pipe System—Supply

24 square feet, or less.....	1	inch
24 to 60 square feet.....	1 $\frac{1}{4}$	“
60 square feet or more.....	1 $\frac{1}{2}$	“

### Two-Pipe System—Supply and Return

48 square feet, or less.....	1	x	$\frac{3}{4}$	inch
48 to 96 square feet.....	1 $\frac{1}{4}$	x	1	“
96 square feet or more.....	1 $\frac{1}{2}$	x	1 $\frac{1}{4}$	“

## Water Radiators

### Tapped for Supply and Return

40 square feet or less.....	1	x	1	inch
40 to 72 square feet.....	1 $\frac{1}{4}$	x	1 $\frac{1}{4}$	“
72 square feet or more.....	1 $\frac{1}{2}$	x	1 $\frac{1}{2}$	“

## Air Valve and Vapor Tappings

All air-valve tappings of Direct Radiators are regularly made  $\frac{1}{8}$  inch.

Vapor Tappings (top and bottom opposite ends), supply  $\frac{3}{4}$  inch, return  $\frac{1}{2}$  inch, or as specified.

## Threads of Openings

Unless otherwise ordered, all openings of Direct Radiators will have right-hand threads.

# "Roughing-In" Measurements

## PIERCE DIRECT RADIATORS



Radiator	Height	A	C	D
	Inches	Inches	Inches	Inches
Pierce Single-Column	20	4½	17½	13
Width Sec., 4½"	23	4½	20½	16
Length of Section	26	4½	23½	19
in Stack, 2½"	32	4½	29½	25
	38	4½	35½	31



Pierce Two-Column	20	4½	17½	13
Width Sec., 7½"	23	4½	20½	16
Length of Section	26	4½	23½	19
in Stack, 2½"	32	4½	29½	25
	38	4½	35½	31
	45	4½	42½	38



Pierce Three-Column	18	4½	15½	11
Width Sec., 9"	22	4½	19½	15
Length of Section	26	4½	23½	19
in Stack, 2½"	32	4½	29½	25
	38	4½	35½	31
	45	4½	42½	38

Dimension "A" given above applies to column radiators where the standard tapping as given on page 77 calls for 1½ inch opening or larger. Center tapped bushings are used in these radiators also on Pierce Wall radiators tapped 1¼ inch or larger.

On all column radiators where the standard tapping is 1 or smaller, eccentric bushings are used and dimension "B" is as follows. Eccentric bushings are used on Pierce Wall radiators tapped 1 inch or smaller.

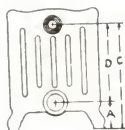
Radiator	Tappings as per Standard		
	1	¾	½
1-2-3 Column "B".....	4¼	4⅛	4½
1-2-3 Column "D" add to "D" above .....	¼	⅜	¾

# “Roughing-In” Measurements

## PIERCE DIRECT RADIATORS (Continued)



Radiator	Height	A	C	D
Pierce	18	4½	15½	11
Four-Column	22	4½	19½	15
Width Sec., 11⅞"	26	4½	23½	19
Length of Section	32	4½	29½	25
in Stack, 3"	38	4½	35½	31
	45	4½	42⅞	38



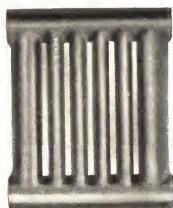
Pierce Six-Column Window				
Width Legs, 13"	13	2¾	11⅞	8⅞
Width Sec., 12"	14	3¾	12⅞	8⅞
Width Top, 13"	16	3¾	14⅞	10⅞
Length of Section	18	3¾	16⅞	12⅞
in Stack, 3"	20	3¾	18⅞	14⅞

Dimension "A" given above applies to column radiators where the standard tappings as given on page 77 calls for 1½ inch opening or larger. Center tapped bushings are used on these radiators, also on Pierce Wall radiators tapped 1¼ inch or larger.

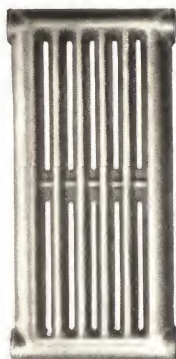
On all column radiators where the standard tapping is 1 inch or smaller, eccentric bushings are used and dimension "B" is as follows. Eccentric bushings are also used on Pierce Wall radiators tapped 1 inch or smaller.

RADIATOR	Tappings as per Standard		
	1	¾	½
4 Column "B".....	4¼	4⅞	4⅞
6 Column 13 in. high "B".....	2½	4⅞	4⅞
6 Column 14-16-18-20 in. "B".....	3½	3⅞	3⅞
4 Column "D" add to above.....	¼	¾	¾
6 Col. 13 in. "D" add to "D" above.....	¼	¾	¾
6 Col. 14-16-18-20 in. high, "D" add to "D" above.....	¼	¾	¾

# Pierce Wall Radiators



5 Ft. Vertical



9 Ft. Vertical



7 Ft. Vertical



9 Ft. Horizontal

## MEASUREMENTS OF WALL RADIATORS

No. and Heating Surface, Sq. Ft.	Height Inches	Length Inches	Thickness Inches
5 Ft. Vertical	16 $\frac{1}{8}$	13 $\frac{7}{8}$	3 $\frac{1}{8}$
7 Ft. Vertical	21 $\frac{3}{8}$	13 $\frac{7}{8}$	3 $\frac{1}{8}$
9 Ft. Vertical	28 $\frac{9}{16}$	13 $\frac{7}{8}$	3 $\frac{1}{8}$
9 Ft. Horizontal	12 $\frac{1}{8}$	29 $\frac{3}{16}$	3 $\frac{1}{8}$

## Pierce Wall Radiators

Pierce Wall Radiators are made in five, seven and nine foot sections, plain pattern only, and can be assembled in units to provide for distribution of heat at special locations in a manner more economical, convenient and effective than coils. Are invaluable for use in public buildings, schools, hotels, restaurants and wherever the floor space is limited.

All size sections are tapped 1½ inch and can be bushed to smaller sizes when so desired.

Pierce Wall Radiators are assembled with 1½ inch R & L malleable screw nipples.

### Directions for Ordering

1. State number of radiators and number of sections in each.

2. State size of section, whether 5, 7 or 9 foot.

3. State whether vertical or horizontal form is desired. (See following pages.)

4. State how many sections long and how many sections high.

For convenience of handling in shipping, we will, unless ordered otherwise, assemble horizontal wall radiation in stacks as follows:

5 ft. up to 6 sections

7 ft. up to 4 sections

9 ft. up to 3 sections

and vertical wall radiation

5 ft. up to 7 sections

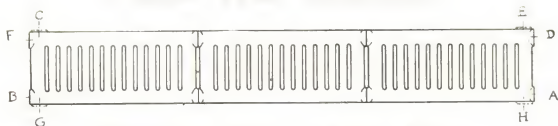
7 ft. up to 7 sections

9 ft. up to 7 sections

When wall radiation is to be erected in stacks larger than these, or when the stacks are to be set in rows or series as shown on page 83, we will ship right and left hand hexagon-head screw nipples to enable the fitter to connect stacks or rows on the job.

We will ship the necessary plugs for openings not required for supply or returns.

## Pierce Wall Radiators

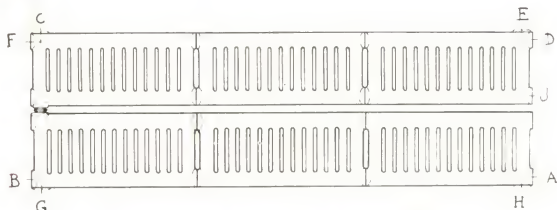


Horizontal Form, 1 Series High

All horizontal radiators are regularly tapped Right Hand at D and A, and Left Hand at F and B. When one or more of these openings are used for supply and return, the remaining are closed. Special tappings at C, E, G and H furnished when required.

For Two-pipe Steam and Hot Water, the regular supply and return are at A and B, unless otherwise ordered.

For One-pipe Steam the regular tapping is at A or B.



Horizontal Form, 2 Series High

All radiators in the above form have connection between the series AT ONE END ONLY, by our regular hexagon center external R & L nipples.

For Hot Water, the supply and return must be at top and bottom, SAME END. Supply may be at E, D or J. (Regular supply is at D or F). Return may be at A or H (regular return at A or B).

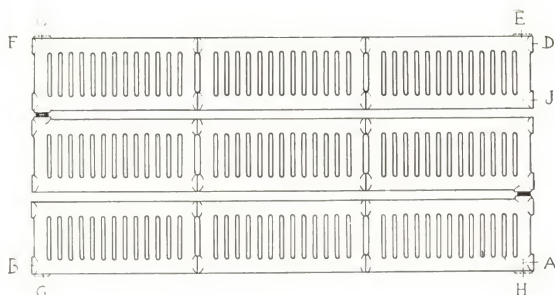
For Two-pipe Steam, the supply and return may be at top and bottom same end, or top and bottom opposite ends. Supply may be at E, D or J (regular supply is at D or F). Return may be at A, H, B or G (Regular return at A or B).

For One-pipe Steam, tapping may be at either A, B or G (regular return at A or B).

On all hot water radiators that are an EVEN number of series high (such as 4, 6, 8, 10, etc.) the supply and return must be on the SAME END of the radiator, top and bottom.



# Pierce Wall Radiators



Horizontal Form, 3 Series High

All radiators in the above form have connection between series AT ALTERNATE END ONLY, by means of regular hexagon external R. & L. nipples.

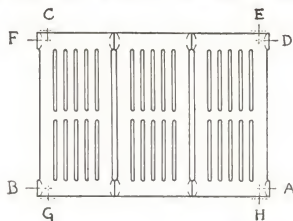
For Hot Water, the supply and return must be top and bottom opposite ends. Supply may be at E, D, J, C or F. (Regular tapping at D or F.) Return may be at B or G. (Regular tapping at A or B.)

For Two-pipe steam, the supply and return may be at top and bottom opposite ends, or top and bottom same end. Supply may be at E, D, J, C or F. (Regular tapping at D.) Return may be at B or G, or at A or H. (Regular tapping at A or B.)

For One-pipe Steam, tapping may be at either A, B, G or H. (Regular tapping at A or B.)

On all water radiators that are an UNEVEN number of series high (such as 5, 7, 9, etc.) the supply and return must be on OPPOSITE END, top and bottom.

## Pierce Wall Radiators

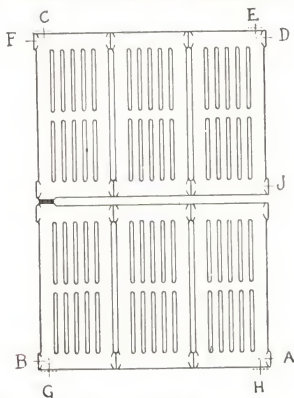


### Vertical Form, 1 Series High

All vertical radiators are regularly tapped Right Hand at D and A, and Left Hand at F and B. When one or more of these openings are used for supply and return, the remaining are closed. Special tapings at C, E, G and H furnished when required.

For Two-pipe Steam and Hot Water the regular supply and return are at A and B, unless otherwise ordered.

For One-pipe Steam, the regular tapping is at A or B.



### Vertical Form, 2 Series High

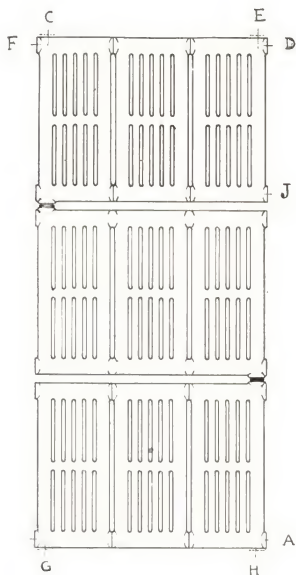
All radiators in the above form have connection between the series AT ONE END ONLY, by means of R. and L. external hexagon nipples.

For Hot Water, the supply and return must be at top and bottom. Supply may be at D, J, C, or F (regular supply is at D or F). Return may be at A, H, B or G (regular return at A or B).

For Two-pipe Steam, the supply and return may be at top and bottom same end, or at opposite ends. Supply may be at E, D, C, F or J (regular supply at D or F). Return may be at A, H, B or G (regular return at A or B).

For One-pipe Steam, tapping may be at either A, B, G or H (regular tapping at A or B).

## Pierce Wall Radiators



### Vertical Form, 3 Series High

All radiators in the above form have connections between series at ALTERNATE ENDS ONLY, by means of external hexagon R. & L. nipples.

For Hot Water. The supply and return at top and bottom.

For Two-pipe Steam, the supply and return may be top and bottom same end or opposite ends.

For One-pipe Steam, tapping may be at A, B, G or H. (Regular tapping at B or A.)

## Barber Wall Radiator Brackets



Type A



Type B

The Barber Bracket is made of malleable iron.

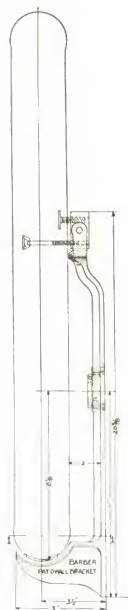
It is supported from the wall by one expansion bolt or lag screw. This bolt passes through a washer with a saw-tooth face, which meshes with a saw-tooth face on the hanger. The hanger can be moved up or down, but is held rigidly in place when the bolt is tightened. The radiation cannot get out of level.

By means of an expansion toggle the radiation may be firmly attached to the hanger, although free expansion can take place.

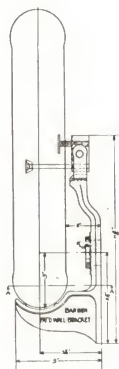
The hanger is provided with an adjusting screw by means of which the radiation may be set plumb.

# Barber Wall Radiator Brackets

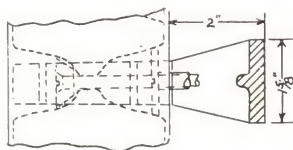
## Constructional Details and Measurements



Type B  
Bracket

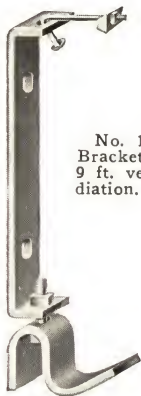


Type A  
Bracket

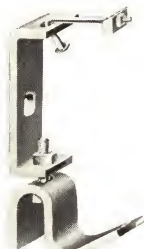


Top View

## Gleockle Adjustable Wall Brackets



No. 1 Gleockle  
Bracket for 7 ft. and  
9 ft. vertical wall ra-  
diation.



No. 2 Gleockle  
Bracket for 5 ft., 7 ft.  
and 9 ft. horizontal  
wall radiation.

The Gleockle bracket wall plate is shaped to furnish a good support and also to keep the radiator 2 inches from the wall. Keeping the radiator this distance from the wall permits it to operate at maximum efficiency. The holes in the wall plate of Bracket No. 1 are spaced 8 inches apart, center to center. This enables these brackets to be used readily in connection with brick as well as with concrete construction. Two bricks will just fit between these holes and the bolts or anchor rods may be passed through the mortar courses. As the holes in the wall plate are oval in shape, there is sufficient play to allow for slight variations in distances.

There is an oval hole also in the top of the wall plate, and this permits lateral adjustment of the tie rod which holds the radiator upright.

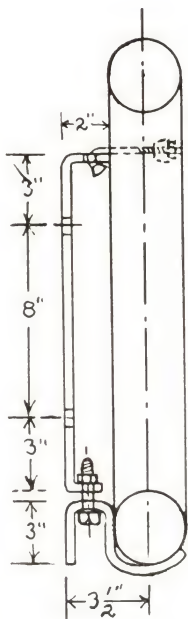
The saddle on which the radiator rests is connected to the wall plate by a bolt which may be adjusted to allow for "pitch" of the radiator. Flexible connection permits movement of the radiator for expansion and contraction.

Wood cleats are unnecessary with Gleockle brackets.

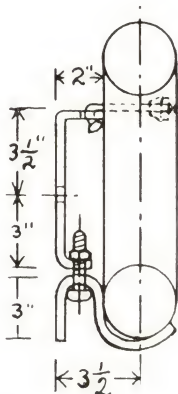


# Gleockle Adjustable Wall Brackets

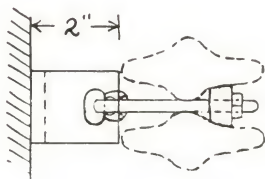
## Constructional Details and Measurements



No. 1 Gleockle Bracket for 7 foot Vertical and 9 foot Vertical Wall Radiation.



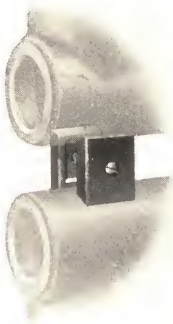
No. 2 Gleockle Bracket for Horizontal Wall Radiation.



Top View, Showing Tie Rod and Radiator Button

The holes in the wall plate are for  $\frac{1}{2}$  inch bolts or lag screws.

## Pierce Wall Radiators

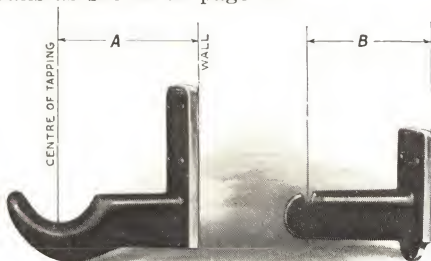


### Pierce Wall Radiator Saddle

This illustration shows the Pierce Wall Radiator Saddle and the manner in which it is applied.

### Concealed Brackets

Concealed Brackets are used to support our one, two, three and four column, Pierce Radiators for side walls as shown on page 74.



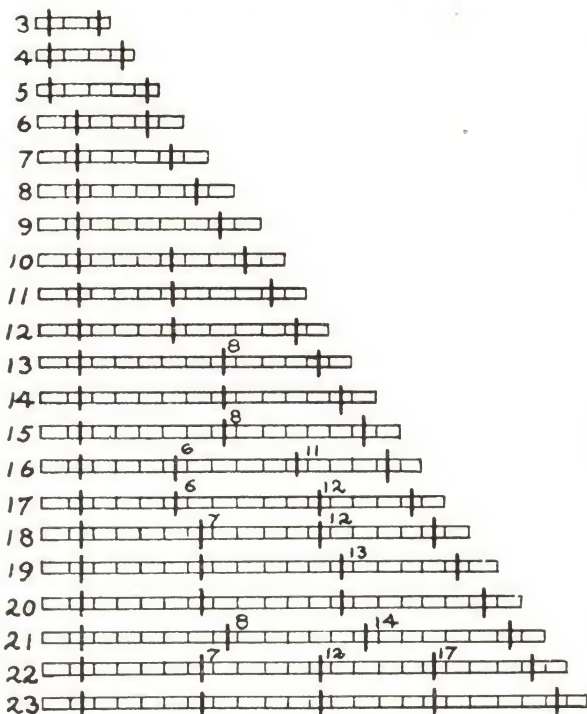
A set of brackets consists of one top and one bottom bracket and under ordinary conditions, two sets will properly support a medium sized radiator.

#### ROUGHING-IN DIMENSIONS

	A	B		A	B
1 Col. Radiator	4 in.	5 in.	3 Col. Radiator	6 in.	4 in.
2 Col. Radiator	4 in.	5 in.	4 Col. Radiator	7 in.	7 in.

# Wall Radiator Brackets

Assembly Diagram Showing Location



The following table gives the number of brackets required to support properly various units of Pierce Wall Radiation assembled horizontally:

Number of 7 Sections	Number of 9 Sections	Number of Brackets
3 to 8	3 to 7	2
9 to 13	7 to 11	3
14 to 21	11 to 16	4

## Pierce Pin Indirect Radiators

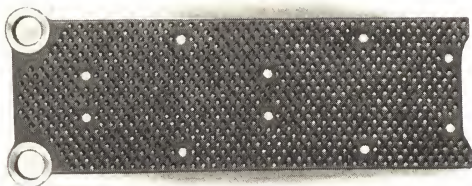
Pierce Pin Indirect Radiators are made for either steam or water and in 15 foot and 20 foot sizes. Unless otherwise ordered, they are tapped 2 inch.

The sections are always shipped separately, as they are very easily assembled and sufficient nipples are sent to assemble same. Two inch extra heavy right and left hand threaded nipples with hexagon nut at centre are used in connecting.

If the sections are assembled at our plant an extra charge will be made. All air valve tappings are made  $\frac{3}{8}$  inch.

### Fifteen Foot Intermediate Sections

Pierce fifteen foot intermediate sections are made with openings at top and bottom as shown in the illustration.



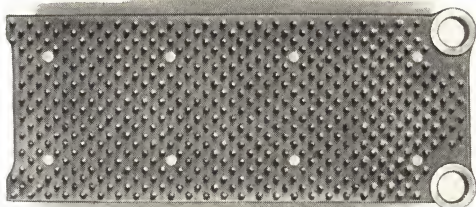
### MEASUREMENTS

Heating surface .....	15 square feet
Length .....	36 $\frac{1}{4}$ inches
Height .....	11 $\frac{1}{2}$ inches
Height at connecting point.....	14 inches
Width in stack.....	2 $\frac{7}{8}$ inches

### Twenty Foot Intermediate Sections

Pierce twenty foot intermediate sections, like the fifteen foot sections, are made with openings at top and bottom.

## Pierce Pin Indirect Radiators

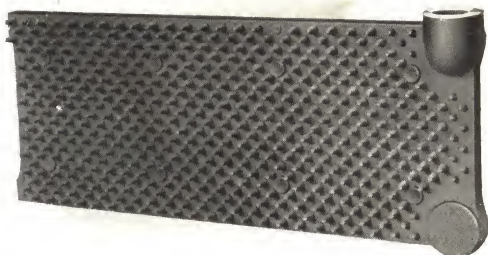


### MEASUREMENTS

Heating surface.....	20 square feet
Length .....	36 $\frac{1}{8}$ inches
Height .....	13 $\frac{7}{8}$ inches
Height at connecting point.....	15 $\frac{1}{4}$ inches
Width in stack.....	4 inches

### End Sections

Pierce end sections are made in both fifteen and twenty foot sizes. In addition to having side openings at top and bottom (on the further side in the illustration below) for connecting with intermediate sections, they are constructed with a tapping boss for connecting with flow or return pipes.



These end sections have the same dimensions as the same sizes of intermediate sections. The bosses for connecting with flow and return pipes are tapped 2 inches.

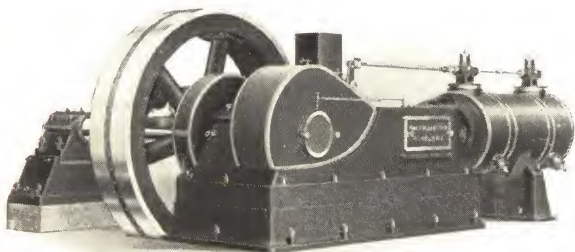
## Power Plant Equipment

The Pierce, Butler & Pierce Manufacturing Corporation owns and operates the AMES IRON WORKS at Oswego, N. Y., an establishment that for more than sixty years has enjoyed a most enviable reputation for quality products.

At the Ames Iron Works we build steel plate boilers of the best known and most used types of High Pressure Horizontal, Tubular, Empire Return Tubular for portable or stationary use and Firebox Return Tubular for low pressure steam heating. This latter type being built with either standard or down draft furnace for the smokeless combustion of soft coal.

We build at the Ames Plant a complete line of high and medium speed Steam Engines ranging in sizes from 50 to 1000 H.P., including the Ames Unaflow Steam Engine, which is the last word in design and economy in the use of steam. We are the first licensee in this country to build a steam engine operating on the full Una-flow principle.

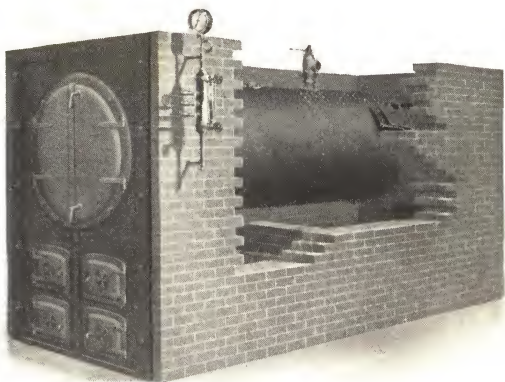
For full details regarding the various products of the Ames Iron Works see special catalogues, which will be sent on request.



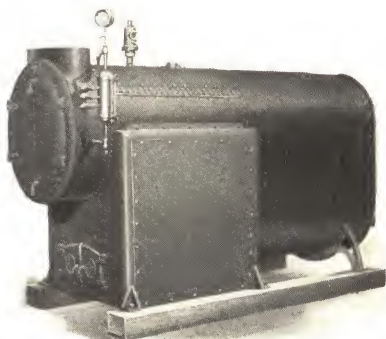
Ames Unaflow Engine



# Power Plant Equipment



Ames Horizontal Tubular Boiler



Ames Empire Return Tubular Boiler



Ames  
Vertical Tubular  
Boiler

## Pierce Packless Valve

In the Pierce Packless Valve we have concentrated on the production of the best valve that skill and good practice can produce, setting a standard of excellence which alone elevates this valve to the highest pinnacle in any comparison. The result is a rare combination of economy, durability and efficiency with a simplicity and beauty which challenges all comparison.

It eliminates the labor of seasonal or periodical repacking; repeated adjustment of the packing nut; cost of packing material; idleness of lines tied up by leakage and repacking; monetary losses which go with wasted steam or other content of line; damage incident to escape of steam, water, etc.; nerve wrecking noise of leaky valves.

It is made of heavy steam metal brass and is triple nickel plated before assembly, thereby preventing the deposits of nickle salts in its working parts. Each valve has all parts machined to precision gage limits, must pass a rigid inspection and is equipped with a genuine Jenkins Brothers valve-disc, so that each can be disassembled without turning steam off the supply pipe. Because of its perfection of design and construction, we guarantee Pierce Packless Valve against escaping steam or water.

On the pages following we list only five of the nine popular styles of Pierce Packless Valves. We manufacture these valves in every standard pattern—globe, angle, off-set corner, with union, or with plain screwed ends. For full information on the complete line, send for our special catalogue.

# Pierce Packless Valves

## Radiator Valve with Wood Wheel



Fig. 119. Angle Valve with Union  
(With Genuine Jenkins Bros. Disc)

### LIST PRICES

Sizes	With Regular Handle	Code Word	Weight in Pounds
1/2-inch	\$3.70	Eager	1.66
3/4-inch	4.30	Eagle	2.13
1-inch	5.10	Earl	2.80
1 1/4-inch	6.40	Earn	3.86
1 1/2-inch	8.40	Ease	5.80
2-inch	13.60	Eat	9.52

Our stock finish is rough body, finished trimmings, nickel plated all over. Prices will be given on other finishes on receipt of specifications.

For full line of Pierce Packless Valves see Valve Catalogue.  
For Dimensions see page 103.

# Pierce Packless Valves

## Radiator Valve with Wood Wheel



Fig. 121. Globe Valve with Union

### LIST PRICES

Sizes	With Regular Wood Handle	Code Word	Weight in Pounds
½-inch	\$3.70	Eger	1.73
¾-inch	4.30	Egress	2.44
1 -inch	5.10	Eject	3.19
1¼-inch	6.40	Eland	4.73
1½-inch	8.40	Elate	6.78
2 -inch	13.60	Elect	11.00

Our stock finish is rough body, finished trimmings, nickel plated all over. Prices will be given on other finishes on receipt of specifications.

For full line of Pierce Packless Valves, see Valve Catalogue.

For Dimensions, see page 103.

# Pierce Packless Valves

## Graduated Radiator Valve

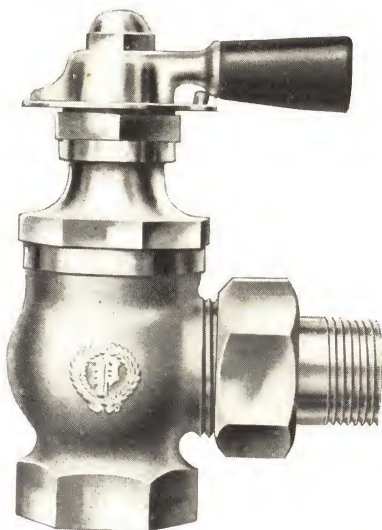


Fig. 131. Angle Valve with Union

### LIST PRICES

Sizes	With Lever and Graduated Dial	Code Word	Weight in Pounds
$\frac{1}{2}$ -inch	\$3.70	Deceit	1.62
$\frac{3}{4}$ -inch	4.30	Decent	2.05
1-inch	5.10	Decide	2.84
$1\frac{1}{4}$ -inch	6.40	Deck	3.80
$1\frac{1}{2}$ -inch	8.40	Decoy	5.71

When ordering please state whether valve is to be used for vapor, steam or hot water.

Our stock finish is rough body, finished trimmings, nickel plated all over. Prices will be given on other finishes on receipt of specifications.

For full line of Pierce Packless Valves, see Valve Catalogue.

For Dimensions, see page 103.

# Pierce Packless Valves

For Working Pressure Up to 200 Pounds



Fig. 144. Globe Valve

## LIST PRICES

Sizes	With Iron Hand Wheel	Code Word	Weight in Pounds
$\frac{3}{8}$ -inch	\$1.25	Hale	1.18
$\frac{1}{2}$ -inch	1.60	Hand	1.69
$\frac{3}{4}$ -inch	2.20	Hang	2.28
1 -inch	2.80	Hard	3.06
$1\frac{1}{4}$ -inch	4.00	Harm	4.47
$1\frac{1}{2}$ -inch	5.50	Harp	6.50
2 -inch	8.75	Hart	10.50

Rough body with finished trimmings.

For full line of Pierce Packless Valves, see Valve Catalogue.

For Dimensions, see page 103.



# Pierce Packless Valves

## High Pressure Angle Valve With Iron Wheel

For Working Pressures up to 200 Pounds



Fig. 145. High Pressure Angle Valve  
(With Genuine Jenkins Bros. Disc)  
(Four-turns-to-open or one-turn-to-open as specified)

Sizes	List Price	Code Word	Weight, lbs.
$\frac{3}{8}$ -inch	\$1.25	Held	1.05
$\frac{1}{2}$ -inch	1.60	Head	1.5
$\frac{3}{4}$ -inch	2.20	Heal	2.18
1 -inch	2.80	Heap	2.76
1 $\frac{1}{4}$ -inch	4.00	Hear	3.97
1 $\frac{1}{2}$ -inch	5.50	Heat	5.
2 -inch	8.75	Heave	9.5

Finish: Rough body, iron wheel and finished trimmings.

With lever handle and graduated dial add 10%.  
For Dimensions, see page 103.

# Pierce Packless Valves

## Roughing-in Dimensions

Valves for Pressures up to 200 Pounds

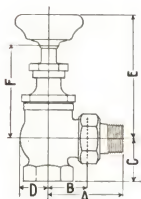


Fig. 119

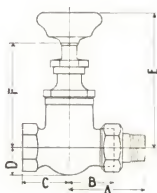


Fig. 121

For Fig. 131, use dimension diagram of Fig. 119.

Figs. 119 and 131

	$\frac{1}{2}$ -in.	$\frac{3}{4}$ -in.	1-in.	$1\frac{1}{4}$ -in.	$1\frac{1}{2}$ -in.	2-in.
A	$2\frac{1}{2}$	$2\frac{5}{8}$	3	$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$
B	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$2\frac{5}{16}$	$2\frac{3}{4}$
C	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{13}{16}$	$1\frac{15}{16}$	$2\frac{1}{8}$	$2\frac{5}{8}$
D	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{7}{16}$	$1\frac{5}{8}$	2
E { 119	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{9}{16}$	$4\frac{11}{16}$	$5\frac{1}{8}$	$5\frac{1}{8}$
F { 131	$3\frac{5}{8}$	$3\frac{9}{16}$	$3\frac{7}{8}$	$4\frac{1}{8}$	$4\frac{1}{8}$	$5\frac{7}{8}$
F { 119	3	$3\frac{1}{4}$	$3\frac{7}{16}$	$3\frac{9}{16}$	$3\frac{7}{8}$	$4\frac{9}{16}$
F { 131	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{7}{8}$	$3\frac{1}{8}$	$3\frac{5}{8}$	$4\frac{3}{8}$

Fig. 121

A	$2\frac{1}{2}$	$2\frac{5}{8}$	$3\frac{3}{8}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$
B	$1\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$
C	$1\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{7}{8}$	2	$2\frac{3}{8}$	$2\frac{1}{2}$
D	$\frac{7}{8}$	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{1}{8}$	$2\frac{1}{8}$
E	$4\frac{1}{2}$	$4\frac{7}{8}$	$5\frac{1}{4}$	$5\frac{1}{2}$	6	7
F	$3\frac{3}{8}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$4\frac{1}{8}$	$5\frac{5}{8}$

# Pierce Packless Valves

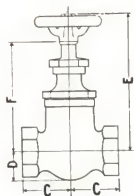
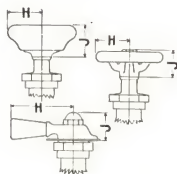


Fig. 144



Handles

Figs. 144 and 145

For Fig. 145 use dimension diagram of Fig. 144.

	$\frac{3}{8}$ -in.	$\frac{1}{2}$ -in.	$\frac{3}{4}$ -in.	1-in.	1 $\frac{1}{4}$ -in.	1 $\frac{1}{2}$ -in.	2-in.
C	1 $\frac{3}{16}$	1 $\frac{11}{32}$	1 $\frac{11}{16}$	1 $\frac{7}{8}$	2 $\frac{1}{16}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$
D	$\frac{3}{32}$	$\frac{7}{8}$	1 $\frac{1}{32}$	1 $\frac{3}{16}$	1 $\frac{3}{8}$	1 $\frac{11}{16}$	2 $\frac{1}{8}$
E	3 $\frac{7}{8}$	4 $\frac{3}{16}$	4 $\frac{11}{16}$	5 $\frac{3}{16}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	7
F	2 $\frac{7}{8}$	3 $\frac{1}{2}$	3 $\frac{15}{16}$	4 $\frac{3}{16}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{7}{8}$

		$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Wood Wheel	{ H	1 $\frac{3}{16}$	1 $\frac{3}{16}$	1 $\frac{3}{8}$	1 $\frac{13}{32}$	1 $\frac{5}{8}$	1 $\frac{13}{16}$
Handles	{ J	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{3}{8}$
Iron Wheel	{ H	1 $\frac{3}{16}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$	1 $\frac{9}{16}$	2	2 $\frac{1}{8}$
Handles	{ J	$\frac{13}{16}$	$\frac{3}{4}$	1	1	1	1 $\frac{1}{8}$
Lever	{ H	2 $\frac{3}{16}$	2 $\frac{3}{16}$	2 $\frac{3}{16}$	2 $\frac{3}{16}$	2 $\frac{3}{16}$	2 $\frac{3}{16}$
Handle	{ J	1	1	1	1 $\frac{1}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$

# Pierce Packless Valves

## Sectional View

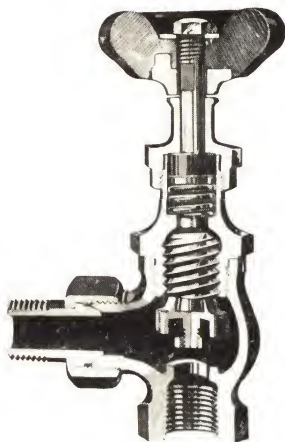


Fig. 119

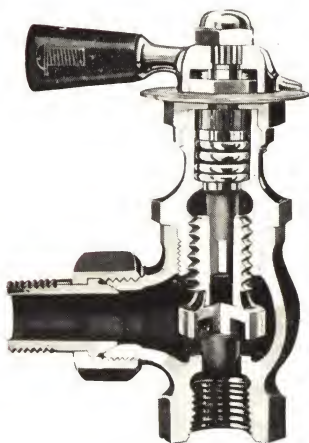


Fig. 131

# Pierce Packless Valves

## Extension Stem Equipment

The architectural design of the interior of a building sometimes makes it necessary to install a radiator under a window seat or in a recess covered by a grill. In such positions, the operating of the radiator valve is difficult unless means are provided for bringing the handle outside the casing. To meet the requirements of this condition we have designed a flexible extension stem which can be furnished with any of the handles shown in the following illustrations. This extension stem is provided with universal joints at each end of the extension bar which permit the handle a maximum of 8 inch offset from the center line of the valve in height of 24 inches.

Where the installation permits the placing of the extension handle directly above the valve, we can furnish any of the above styles without the universal joints, as in Fig. XVII.

These extension handles can be furnished either polished and lacquered, or polished and nickel plated.

Connecting bars,  $\frac{5}{16}$  inch square, are furnished with each handle, cut to the length as specified by the customer. To obtain the length of the extension bars, the distance from the surface of the seat or casing to the end of the recess for the upper end of the bar is given on the dimensioned drawings on page 107. The dotted lines indicate the location of the end of the bar. When a straight extension is needed, use the smaller dimension, and when an offset is needed, use the longer. The same instructions apply to the drawing of the yoke at the top of the valve. The distance, F, from the bottom of the yoke to the center of the valve outlet is given on each of the various valve drawings.

# Pierce Packless Valves

## Extension Stem Equipment



Fig. 138. Straight Pattern  
with Wood Wheel



Fig. XVII. Packless  
Valve with Lockshield\*



Fig. 141. Lever Handle with Graduated Dial Offset

	Figure No.	138	141
Straight	Polished and Lacquered	\$1.25	\$2.20
Straight	Polished and Plated	1.50	2.40
Offset	Polished and Lacquered	1.40	2.30
Offset	Polished and Plated	1.66	2.50

\*Prices same as Fig. 119. Keys extra.



# Pierce Packless Valves

## Dimensions of Extension Stem Equipment

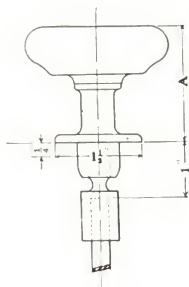


Fig. 138

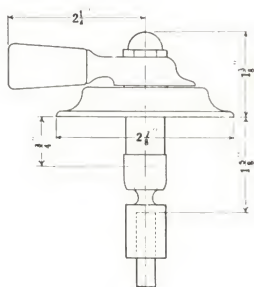
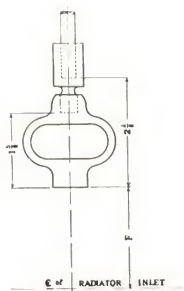


Fig. 141

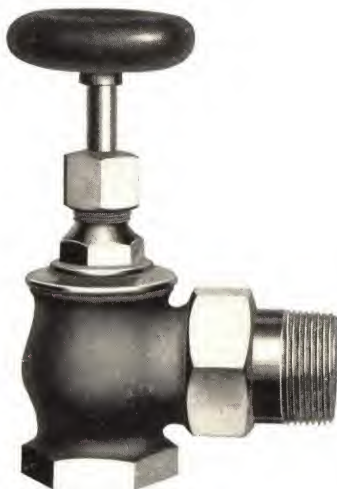


Yoke for Valve Stem

Sizes, Inches		1/2	3/4	1	1 1/4	1 1/2	2
A	Bot. of Flange to Top of Wheel .....	2	2	2 1/8	2 1/8	2 1/8	2 3/8
F	Center of Inlet to Bot. of Yoke .....	See Dim "F" under Drawing of Valve to be used					

# Pierce Valves

## Standard Steam Radiator Valve



### Ground Joint Union—Jenkins Disc

No.	Style*	½"	¾"	1"	1¼"	1½"	2"
41	Rough body, plated all over	\$3.70	\$4.30	\$5.10	\$6.40	\$8.40	\$13.60
42	Finished body, plated all over	3.65	4.25	5.25	7.00	9.25	14.35

These valves are made with male unions only, threads right hand on union, right hand on bottom.

\*Other finishes on application.

Lock Shield same price as Wood Wheel. Keys extra.

# Pierce Valves

## Standard Q. O. Bonnetless Water Radiator Valve



### Ground Joint Union—Male Union Only

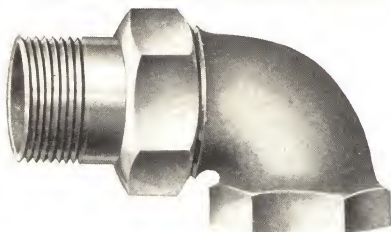
No.	Style	½"	¾"	1"	1¼"	1½"	2"
51	Rough body, plated all over	\$3.25	\$3.70	\$4.50	\$5.75	\$7.30	\$12.00
53	Finished body plated all over	2.90	3.40	4.30	5.80	8.10	12.35

A half turn of the wheel opens or closes this valve.

These valves are made with male unions only. Threads, right hand on union, right hand on bottom. Lock Shield same price as Wood Wheel Valve. Keys extra.

## Pierce Valves

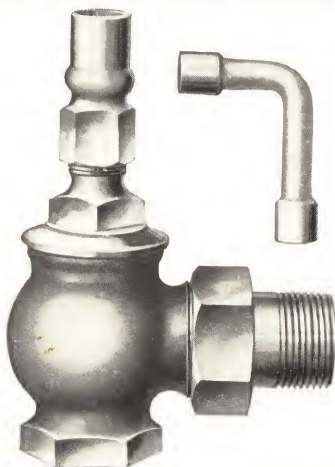
### Standard Union Radiator Elbow



* Style	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Rough body, plated all over	\$1.75	\$2.00	\$2.50	\$3.30	\$4.25	\$7.20
Finished body, plated all over	2.25	2.40	3.00	3.90	4.85	8.50

\*Other finishes on application.

### Standard Lock and Shield Radiator Valve



#### Ground Joint Union—Jenkins Disc

Keys extra, plain, 20c; plated, 25c, each.

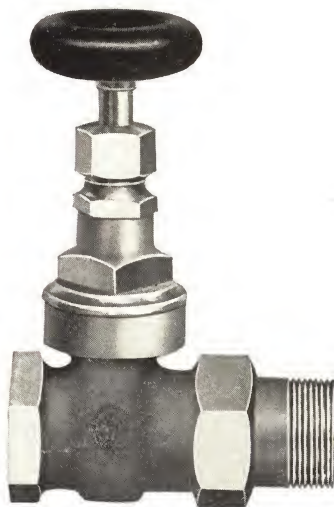
Any style valve can be furnished with Lock Shield.

List price is the same as Wood Wheel.

When ordering specify number and style of valve wanted, adding Lock Shield.

# Pierce Valves

## Standard Radiator Gate Valve



### Wood Wheel with Union, Double Wedged Discs and Non-rising Stem

No.	*Style	½"	¾"	1"	1¼"	1½"	2"
255	Rough body, plain	\$3.20	\$3.75	\$4.65	\$6.00	\$8.25	\$11.90
256	Rough body, plated all over	3.65	4.25	5.20	6.60	9.00	12.80

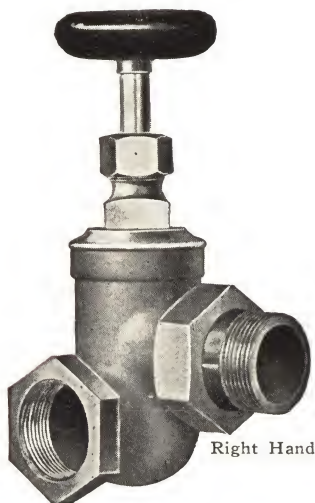
These valves open to the left, have non-rising stems, ball and socket joints on discs.

\*Other finishes on application.

# Pierce Valves

## Offset Corner Radiator Valve

RIGHT OR LEFT



## Ground Joint Union—Jenkins Disc

No.	*Style	½"	¾"	1"	1¼"	1½"	2"
11	Rough body,						
	Finished trimm'gs	\$3.15	\$3.85	\$4.75	\$6.45	\$8.55	\$13.85
12	Finished all over	3.60	4.50	5.50	7.20	9.55	15.35
14	Rough Body,						
	plated all over	4.10	4.75	5.60	7.05	9.25	15.00
15	Finished and Plated						
	all over	3.70	4.85	6.00	7.80	9.95	15.95

Special by-pass provided when used for hot water.

These valves are made with male unions only, threads right hand on union, right hand on bottom.

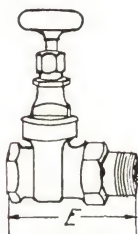
When ordering specify right or left hand valves.

\*Other finishes on application.

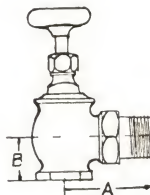


# Pierce Standard Radiator Valves

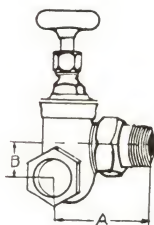
## "Roughing In" Dimensions



Cat. No.  
255, 256



Cat. No.  
41, 42, 51, 53



Cat. No.  
11, 12, 13, 14



Cat No.		$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
11, 12, 13, 14.....	{ A	$2\frac{3}{4}$	$2\frac{9}{16}$	$3\frac{3}{16}$	$3\frac{5}{16}$	$3\frac{11}{16}$	$4\frac{1}{2}$
	{ B	$\frac{11}{16}$	$\frac{11}{16}$	1	$1\frac{3}{16}$	$1\frac{5}{8}$	$2\frac{3}{16}$
	{ C	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{5}{8}$	2	$2\frac{1}{8}$	$2\frac{3}{4}$
41, 42 .....	{ A	$2\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{1}{16}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$4\frac{5}{16}$
	{ B	1	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{5}{16}$
51, 53 .....	{ A	$2\frac{1}{8}$	$2\frac{1}{2}$	3	$3\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{9}{16}$
	{ B	1	$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{11}{16}$	2	$2\frac{1}{4}$
255, 256 .....	E	3	$3\frac{1}{2}$	4	$4\frac{3}{8}$	5	$5\frac{1}{2}$

## Pierce No. 1 Air Valve



The vast superiority over widely advertised imitators who can not incorporate its essential features, which are fully patented, has created an enormous demand, as a result of which we are able to furnish this valve at a remarkably low price.

The Pierce No. 1 is made entirely of metal, each part being composed of that special alloy best adapted for the particular purpose. All parts, with the exception of the float valve pin, which is made of a nickle alloy, and the seat plug, which is turned from rod brass, and drawn, not cast, the drawn brass being much stronger.

It is designed particularly for systems of the one pipe gravity type. Through its use all air is automatically vented from every radiator without loss of steam; maximum efficiency is assured; leakage from "water-logged" radiators is prevented. On contact of water with valves, the syphon drains all water from the valve and venting occurs even if the radiator is under pressure.

Guaranteed for five years.

## Air Valves

### Pierce Pneu-Vent No. 2 Syphon Float Air Valve



Thousands of our patrons are constantly assuring us that this valve can nowhere be duplicated in efficiency and price. It is composed of the best materials obtainable and is manufactured in such quantities as to make its unit price negligible.

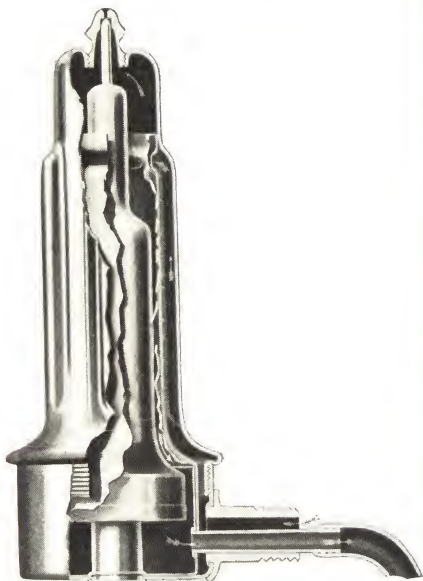
The thermo expansible member in the Pneu-Vent No. 2 is set in a socket and not only will not split when set screw is adjusted, but is at the same time very sensitive. The pin in the float is flame soldered. Adjustment is made at factory and valve may be adjusted independently of the packing gland. It automatically opens to permit the discharge of cold air but closes against water or steam.

These features result in a well made, perfectly finished and extremely economical air valve.

Packed one dozen in a carton.....\$12.00

## Hoffman Air Valves

Syphon Automatic No. 1, Non-Adjustable



The Hoffman Syphon Air Valve perfectly and effectively distinguishes between steam and air and between water and air, closing tight against steam or water but freely venting all the air from the radiator, no matter whether the air is hot or cold.

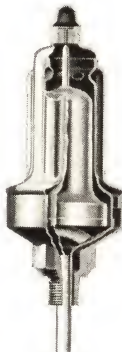
It is of all metal construction and in common with all Hoffman Valves, is guaranteed for 5 years.

List price .....\$1.90

## Hoffman Air Valves



No. 4



No. 5

The No. 4 Quick Vent Valve is designed for use in venting risers or return mains where water will not come in contact with the valve. All air is freely vented through a  $\frac{1}{8}$  inch vent port without loss of steam, although valve will not prevent escape of water.

Standard connection is  $\frac{3}{4}$  inch, although this can be furnished  $\frac{1}{4}$  inch if so desired.

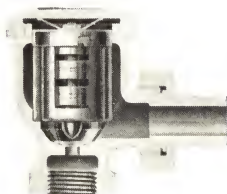
List Price.....\$2.80

The No. 5 Quick Vent Float Air Valve is of the triple duty type, intended for venting return mains, indirect stacks and for use under all conditions where water is present in the system. It vents all air, closes tightly against steam and prevents escape of water through vent port. Installed on the end of return mains in one pipe gravity systems, this valve causes steam to flow first to the end of the main, then into the radiators at a uniform rate, so that the radiators distant from the boiler will receive their supply of steam as quickly as those close to the boiler.

Furnished with a  $\frac{3}{8}$  inch pipe connection;  $\frac{1}{8}$  inch port for pressures below 3 lbs.;  $\frac{1}{4}$  inch port for 3 lbs. or over.

List Price.....\$8.00

## Hoffman Air Valves



The No. 8 and 9 Return Line Valves or radiator traps, freely relieve air and condensation from radiators in vapor or vapor vacuum systems without steam loss. They are also used as steam traps where pressure does not exceed 50 lbs. Installed in systems where steam is supplied through a reducing valve, proper trap operation is assured even if reducing valve fails to function and admits high pressure steam to the system, for within its working range the trap operates with the same degree of sensitiveness. This valve is absolutely non-adjustable and thermostats can be changed from one body to another without "setting"; likewise the valve may be used under either high or low pressure without adjusting.

The No. 8 valve has  $\frac{1}{2}$  inch pipe connections and is furnished in angle, straightway, right and left hand offset patterns. Its normal capacity is 200 square feet of cast iron radiation.

The No. 9 valve with  $\frac{3}{4}$  inch connections is made in angle pattern only and is suitable for 600 square feet of cast iron radiation.

No. 8 with  $\frac{1}{2}$  inch connection,  $\frac{1}{4}$  inch diameter port.

All styles, list price.....\$6.00

No. 9 with  $\frac{3}{4}$  inch connection, specify  $\frac{3}{8}$  inch port for pressure under 15 lbs.; for high pressures,  $\frac{1}{2}$  inch port.

Angle pattern only, list price.....\$8.00



## Hoffman Air Valves



The No. 10 vapor valve is intended for venting the return mains of large vapor systems or for dry service where large capacity is required and steam air or water must be properly handled. The main or  $\frac{3}{4}$  inch port, controlled by the float, has an auxiliary port  $\frac{3}{16}$  inch in diameter. The purpose of this double valve is to permit venting even though pressure is maintained after a surge of water recedes from the valve. An airway equivalent to a  $\frac{3}{4}$  inch diameter valve port is maintained throughout the valve, permitting venting with little resistance.

No. 10 valve, with  $\frac{3}{4}$  inch pipe connection,  
list price.....\$25.00

## Hoffman Air Valves



No. 11 Vapor Vacuum Valve is similar in construction to the No. 10 with the addition of a check valve in the vent port which prevents the return of air to the system through the vent port. It is widely used for venting the return mains of vapor-vacuum systems or for other conditions where the returns of air to the systems, after having been vented, is not desirable.

No. 11 Valve, with  $\frac{3}{4}$  inch connection,  
List Price.....\$28.00

The Differential Loop prevents water from backing up in the return main and, at the same time, maintains a constant differential pressure between steam and return mains whenever the pressure exceeds a pre-determined amount. In standard loops for residential work, the usual pressure at which the loop operates is 10 ounces and there will be no loop action until the pressure exceeds this amount. This pressure causes the water to rise in the vertical part of the return main  $17\frac{1}{2}$  inches above the boiler water line. Further use is not permitted for the water column in the loop, which normally seals the connection between steam and return main, permits a small quantity of steam to "blow over" into the return main, closing the thermostatic vent, compressing the air on the return mains and building up a differential pressure which does not allow the water to rise in the return beyond the pre-determined height of  $17\frac{1}{2}$  inches.

Differential loops are made in four standard sizes, the largest having a capacity up to 10,000 square feet of direct radiation; larger sizes are made to order for the individual requirements of each installation. Sold in conjunction with Pierce Basement Specialties. (See following page.)



## Pierce "Controlled Heat" Specialties

To assist the heating contractor in quickly estimating the cost of Specialties for Vapor or Vapor-Vacuum heating installations, the following method has been devised.

To figure price for the specialties it is only necessary to obtain data as to the number of radiators, the total amount of radiation and information as to whether the steam mains or risers are dripped through return line valves, then refer to the following table:

For example, the cost of Specialties for a fifteen-radiator installation containing 625 sq. ft. of radiation, would be:

15 Radiators @ \$12.00 each.....	\$180.00
1 Set Class A Basement Specialties.....	112.00
Total List Price.....	\$292.00

### Radiator Specialties

- 1 Fig. 131 Pierce Packless Valve. (Capacity up to 200 sq. ft. radiation.)
- 1 No. 8 Hoffman Return Line Valve. (Capacity up to 200 sq. ft. radiation.)
- List price, per radiator.....\$12.00

### Class (A) Basement Specialties

For installations up to 1500 sq. ft. direct radiation, consisting of—

- 2 No. 8 Hoffman Return Line Valves for venting steam mains.
- 1 No. 1 Hoffman Differential Loop.
- 1 No. 11 Hoffman Air Eliminator
- 1 No. 925 Sylphon Damper Regulator.
- 1 No. 405 Pierce Compound Pressure and Vacuum Gauge.
- List price .....\$112.00

### Class (B) Basement Specialties

For installations of 1501 to 3000 sq. ft.  
direct radiation, consisting of—

- 3 No. 8 Hoffman Return Line Valves for venting  
steam mains.
- 1 No. 2 Hoffman Differential Loop.
- 1 No. 11 Hoffman Air Eliminator.
- List price .....\$133.00

### Class (C) Basement Specialties

For installations of 3001 to 5000 sq. ft.  
direct radiation, consisting of—

- 4 No. 8 Hoffman Return Line Valves for venting  
steam mains.
- 1 No. 3 Hoffman Differential loop.
- 2 No. 11 Hoffman Air Eliminators.
- List price .....\$192.00

### Class (D) Basement Specialties

For installations of 5001 to 10,000 sq. ft.  
direct radiation, consisting of—

- 6 No. 8 Hoffman Return Line Valves for venting  
steam mains.
- 1 No. 4 Hoffman Differential Loop.
- 2 No. 11 Hoffman Air Eliminators.
- List price .....\$242.00

Where risers or ends of steam mains are  
dripped through Return Line Valves, add  
\$6.00 list for each No. 8 or \$8.00 list for each  
No. 9 Valve.

Where more than one boiler is used, add  
\$37.00 list for specialties required for each  
additional boiler.

Special or larger installations than above  
quoted upon application.

## Air Valves

### Compression Wood Wheel Valve



These valves are made of best quality steam brass, heavily nickel-plated both inside and outside. Every valve is tested before packing to insure tight closing under working conditions.

Threaded  $\frac{1}{8}$  inch, I. P. S.....Each \$ .70

### Compression Key Valve



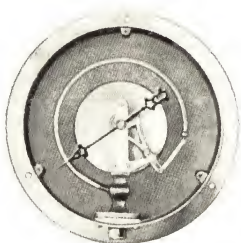
These valves are made of same materials and are finished and tested same as Wood Wheel Valves above.

The keys are of uniform size and every one fits the valve head perfectly.

Threaded  $\frac{1}{8}$  inch, I. P. S.....Each \$ .70

Two keys are furnished with each twenty-four valves.

## Pierce Gages



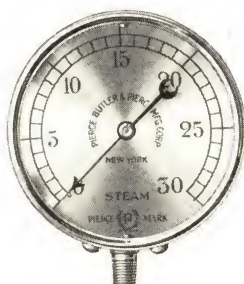
The illustration shows the internal mechanism of the Pierce Standard Pressure Gage.

The regular construction consists of a cast iron case of such substantial proportions as to withstand the effects of vibration or of abuse and distortion, at the same time retaining the accuracy of the gage within practical limits (movement being mounted on the back of case) and with a sector cut from thick plate which presents at the pinion, a tooth-surface of unusual width for this type of gage.

On account of the care exercised in the selection and treatment of the materials of which our springs are made, we are able to guarantee that, with proper use, Pierce gages will not take on in service any permanent "set" which will impair the accuracy of readings.



## Pierce Low Pressure Gage\*



For low pressure steam heating boilers.

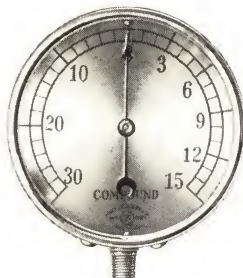
Cast iron cases with beaded ring in polished brass or nickle finish. Standard graduation, 30 pounds.

### PRICES—COCK INCLUDED

Size	Iron Case Brass Ring	Iron Case N. P. Ring	Pipe Connection
5" Dial	\$8.00	\$8.20	$\frac{1}{4}$ " Male
4 $\frac{1}{2}$ " Dial	8.00	8.20	$\frac{1}{4}$ " Male
3 $\frac{1}{2}$ " Dial	7.00	7.20	$\frac{1}{4}$ " Male

\*See Pierce Gauge and Thermometer Catalog for details of our complete line. Prices on application for gauges and thermometers supplied with customer's name.

## Pierce Standard Compound Pressure and Vacuum Gage\*



Used on vacuum heating systems, and on receivers of compound steam engines. Has double scale, one side reading pressure in pounds per square inch, the other vacuum in inches of mercury. Can be furnished with back connection if desired, standard graduation from 30 inches vacuum to 15 pounds pressure. Pressure side should be graduated to double the average pressure to be indicated.

Sizes 2 to 5 inch, inclusive, have beaded cases and rings; larger sizes have flanged cases and rings.

### PRICES, INCLUDING COCKS, 2" DIAL AND LARGER

Size Inches	Iron Case, Brass Ring	Iron Case, N. P. Ring	Finished Brass Case	N. P. Case	Pipe Connection
12	\$60.00	\$84.00	\$61.50	\$80.00	¼" Female
10	40.00	53.00	41.00	50.00	¼" Female
8½	30.00	42.00	30.75	40.00	¼" Female
6¾	20.00	27.00	20.60	25.00	¼" Female
6	16.00	21.50	16.50	20.00	¼" Male
5	14.00	17.25	14.25	16.00	¼" Male
4½	12.00	15.00	12.20	14.00	¼" Male
3½	10.00	12.75	10.18	12.00	¼" Male
3	9.00	11.60	9.15	11.00	¼" Male
2½	9.00	11.60	9.15	11.00	¼" Male
2	9.00	11.60	9.15	11.00	¼" Male

\*See Pierce Gauge and Thermometer Catalog for details of our complete line. Prices on application for gages and thermometers supplied with customer's name.

## Pierce Standard Altitude Gage\*



To indicate accurately the height of water in feet in a hot water heating system at the boiler, standard graduation, 70 feet although other graduations can be furnished if desired. Has auxiliary red pointer which can be set to indicate the normal altitude to be registered.

### PRICES—COCK INCLUDED

Size	Iron Case Brass Ring	Iron Case N. P. Ring	Pipe Connection
5" Dial	\$12.00	\$12.20	¼" Male
4½" Dial	12.00	12.20	¼" Male
3½" Dial	10.00	10.18	¼" Male

Directions for installing. When water is at the proper level in expansion tank, remove the ring and glass and set the stationary hand at the elevation indicated by the working hand. Whenever the working hand falls below this point, water should be added.

\*See Pierce Gauge and Thermometer Catalog for details of our complete line. Prices on application for gauges and thermometers supplied with customer's name.

## Pierce Standard Hot Water Thermometers



Fig. 412



Fig. 413

Pierce Thermometers are precision thermometers. We do not use printed or lithographed tin stock scales because an accurate and honest thermometer must have its own individual scale, especially engraved to fit its range. Therefore, deeply engraved on a brass plate, each has its own scale which is correctly compensated to the diameter of the hole in its tube as well as the most minute variation in the size of the bulb.

The liquid in tubes may be mercury or a suitable red or blue fluid and contains no graphite. Here again Pierce superiority is shown by our guarantee against fading of colored fluid.

Designed for hot water heating, hot water supply systems, shower baths, etc. Cast aluminum case with full nickel finish, engraved brass scale, oxidized a brilliant and permanent black, with white figures and graduations protected by a durable coating of lacquer.

Socket connection has  $\frac{1}{2}$  inch pipe thread and contains full mercury bath, making perfect metallised contact with the bulb.

Fig. 412 (straight).....	\$3.00
Fig. 413 (angle).....	3.50

## Pierce Mercury Heat Generator



A simple, indestructible device connected with the expansion pipe of hot water systems. Its use permits a 10% reduction in amount of radiation required; 25% decrease in size of pipes and valves; and a 20% saving in the cost of material and labor.

Can easily be installed on old or new jobs, and will save many systems which show poor circulation.

No. 1, for less than 1500 sq. ft. radiation.....	\$25.00
No. 2, for 1500 sq. ft. or more.....	35.00

Furnished with valves set for 10 lbs. pressure. Valves for greater pressure on order.

## Stop Cocks (Rough Brass)\*

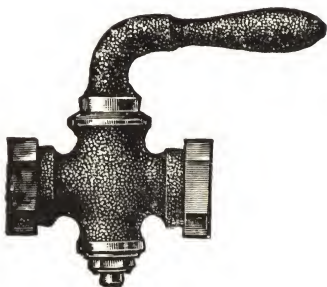
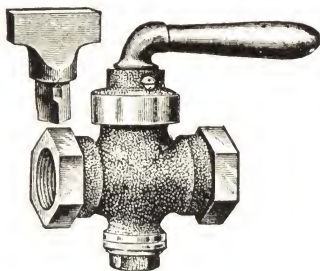


Fig. 224 stops have lever handle and flat way.

Fig. 220 stops have the patent guard or cap, flat way with malleable handles, either right or left hand tee, lever or socket as desired.



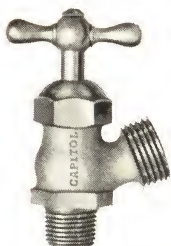
### LIST PRICE

Size	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "
Per dozen.....	\$20.40	\$21.00	\$29.40	\$36.00
Size	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"
Per dozen.....	\$52.80	\$89.40	\$149.40	\$258.00

\*Also furnished in finished brass or nickel plate patterns.



## Boiler Cocks



Drain Cocks



Draw-off Cocks

Pierce boiler cocks are carefully manufactured of high grade metal with rough nickel plated finish.

Drain cocks may be used as wash tray bibbs.

### LIST PRICES PER DOZEN

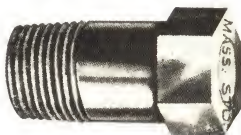
Size	1/2"	3/4"	1"
Draw-off, I. P. Male.....	\$18.00	\$21.00	\$27.00
Drain, I. P. Male, Hose End.....	17.40	22.80	.....
Drain, I. P. Male, Plain End.....	17.40	22.80	.....

## Standard Fusible Plugs

All plugs are filled with Straights or Banca tin and are stamped in accordance with U. S. Government specifications.



Short Pattern



Inside Pattern

### LIST PRICES

Size	3/8"	1/2"	3/4"	1"	1 1/4"
Outside or Inside Pattern.....	\$1.00	\$1.20	\$1.50	\$2.00	\$3.00
Short Pattern.....	.50	.60	.75	1.00	1.50

## Excelso Water Heaters



The Excelso water heater consists of a heavy copper coil heating element fitted in a cast iron shell by means of patented ground joint connections. All parts are interchangeable and easily accessible.

The Excelso heater can be easily connected below the water line of any steam or vapor heating boiler in new or old installations.

It may also be used for heating domestic water or other liquids by means of live steam at any pressure not in excess of 25 pounds.

Many tanks are installed too small and heaters should always be ordered to correspond with work required, regardless of tank capacity. Also make a liberal allowance if circulating system is used.

### PRICE LIST AND DIMENSIONS

Size of Heater	11	12	13	14	15
Length, Ins.	10 $\frac{1}{2}$	14	11 $\frac{1}{2}$	15	19 $\frac{1}{2}$
Diameter, Ins.	5	5	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$
Shell Openings	1"	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
Coil Openings	$\frac{3}{4}$ "	$\frac{3}{4}$ "	1"	1"	1"
Wt. Crated, lbs.	17	23	31	39	46
List Price	\$30	\$40	\$50	\$60	\$70

### Heating Capacities Below Water Line of Steam or Vapor Boilers

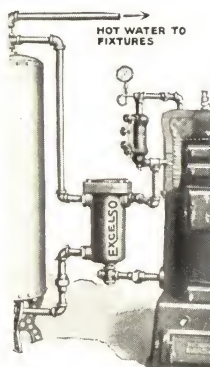
Size of Heater	11	12	13	14	15
Tank Capacity	30	45	60	90	120

Temperature rise 100 degrees in three hours.

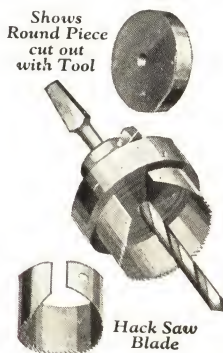
### Capacities with Live Steam

Size of Heater	11	12	13	14	15
Tank Capacity	50	75	100	150	200

Temperature rise 100 degrees in 3 hours at 5 lb. pressure.



## Rotary Hack Saw Tool



To cut top or boiler openings below water line of steam and vapor boilers. Made for 1, 1 $\frac{1}{4}$  or 1 $\frac{1}{2}$  inch so that by inserting the proper size blade, a perfectly round hole is sawed in the boiler section of just the right diameter in which to start the pipe tap.

There is a small  $\frac{1}{4}$  inch drill in the tool which is put through boiler section first and acts as a center for the saw.

This handy tool complete with full set of blades, \$7.50.

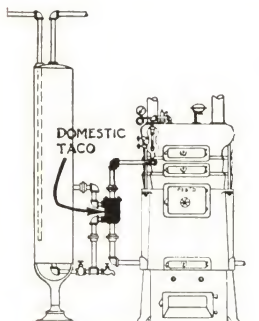
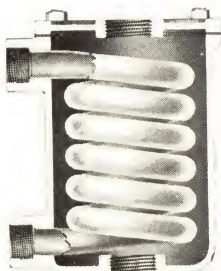
Extra blades at small cost.

# Domestic "TACO" Water Heater

For Heating Domestic Water

Connected with Steam or Vapor Heating Boilers

The Taco is installed at the side of the heating boiler and below the water line, as shown. The connections to range boiler are as usual, it being installed vertically on the same floor level as the house heating boiler or on the floor above if desired.



The boiling water within the heating boiler circulates through the "TACO" heater and in doing so transfers heat to raise the temperature of the domestic water supply passing through the copper coil. This heat transfer is a continuous process and the range boiler is kept filled with hot water.

Size No.	Range Boiler Suitable For	Inlet and Outlet Water Conn's	Boiler Connections	List Price	Shipping Weight Pounds
30	Up to 30 gals.	$\frac{3}{4}$ "	1"	\$15.00	12
1	40 to 60 gals.	$\frac{3}{4}$ "	1"	20.00	15
2	Up to 80 gals.	1"	1 $\frac{1}{4}$ "	30.00	25
3	Up to 160 gals.	1 $\frac{1}{4}$ "	2"	50.00	50

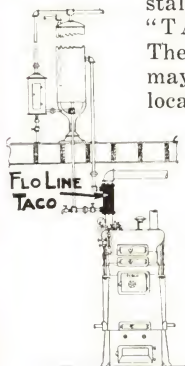
# Flo-Line "TACO" Water Heater

FOR HEATING DOMESTIC WATER

Connected with Steam or Vapor Heating Boilers

The domestic water supply is heated by its circulation through the copper coil, which is in the flo-line from the steam or vapor heating boiler.

To be installed, as illustrated—and piped to a range boiler installed above the "TACO" Heater. The range boiler may, therefore, be located on the floor



above, or mounted horizontally beneath the floor beams, provided it is above the outlet connection from the "TACO."

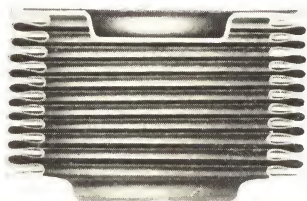
Sufficient vapor available at night or during mild weather to assures an abundant supply of hot water at all times. Full area through main is provided for by the diameter of "TACO" being increased.

Size No.	Range Boiler Suitable For		Water Conn. to Coil	Height Over-all	Flange Tappings Top & Bottom		List Price	Shipping Weight, lbs.
	With Steam	With Hot Water			Standard	Special		
01	60 Gal.	20 Gal.	$\frac{3}{4}$ "	$9\frac{3}{8}$ "	3"	1-2 or 4"	\$25	25
02	120 "	40 "	1"	$13\frac{7}{8}$ "	4"	$1\frac{1}{2}$ -2 or 5"	\$35	40
03	240 "	80 "	$1\frac{1}{4}$ "	$19\frac{5}{8}$ "	5"	2-3 or 6"	\$55	75

NOTE—The Flo-Line "TACO" Heater is recommended for use in connection with hot water heating plants ONLY where provision is made for the use of gas or coal heater on wash days and at such other times as extremely hot water is required. Domestic water will be heated to within twenty degrees of heating plant temperature. Its use will be a convenience in the home and will save gas or coal.



## Sylphon Temperature Regulators



The Sylphon Seamless Metal Bellows

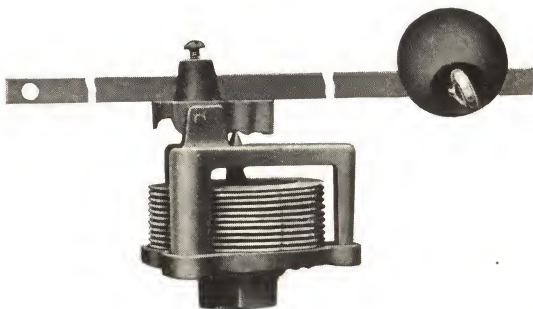
The damper and temperature regulators shown in following pages are of all metal construction, their diaphragms are the Sylphon flexible metallic bellows. This remarkable Sylphon bellows, so favorably known and widely used in the engineering field, is constructed of special brass, entirely seamless, with deep accordian-like folds which insure a long movement and a high degree of sensitiveness to even slight changes in pressure. Thus is produced the greatest dependable and positive action in control devices of this type, combined with such durability that its accurate service is permanent. It represents a step far in advance of the old rubber, flat-plate or built-up soldered-disc diaphragms and insures satisfactory regulation which is such an indispensable factor in personal comfort and economy of boiler operation.

In the thermostatic regulators for hot water, laundry and garage boilers and steam heated tanks, the Sylphon bellows is the moving part of the regulator and is extended or contracted by pressure change in the vapor of a volatile liquid, trapped in the sensitive bulb which is exposed to the temperature to be controlled. This combination produces highly sensitive yet positive control.



## No. 22 Sylphon Steam Regulator

For Damper Control of Low Pressure Steam Boilers



This regulator is furnished on all Pierce Steam Boilers without additional charge.

It is composed entirely of metal; is frictionless; is sensitive; and is positive and invariable in its action. The simplicity of its construction will be seen in the illustration.

It operates on a slight change in pressure, closing the dampers if desired at a very low steam pressure, shifting the counterpoise weight determines the pressure which will be accurately maintained.

Accordion sides of the bellows are formed of ten deep folds which permit ample yet very sensitive expansion effect upon the vertical rod which connects the top of the bellows to the bar upon which the counter balance weight is placed.

### Data and Dimensions

Tapped at bottom connection for 1 inch std. I. P.; bellows 4 $\frac{5}{8}$  inches O. D.; lever bar 36 inches long (other lengths furnished on special order). Adjusting weight 3 lbs. Shipping weight, boxed, 17 lbs.

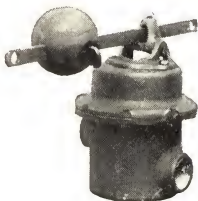
Shipped complete with 12 feet of chain, 4 S-hooks, 1 1 inch close nipple, 2 ceiling pulleys, lever bar and one adjusting weight.

List price, each.....\$20.00

# Sylphon Water Temperature Regulators

NOS. 42, 43 AND 44

For Damper Control of Water Boilers  
and Tank Heaters



This regulator adjusts the dampers according to changes in water temperature. The water circulates in the regulator around an inner shell which contains a volatile liquid. As the temperature increases the liquid volatilizes and expands a bellows, tilting the lever and moving the dampers. This operation is reversed as the water cools. Weights are set to maintain different temperatures.

Regulators Nos. 42, 43 and 44 are identical in construction, the only difference being that each operates in a different range of temperature as indicated.

## Data

No. 42 for water temperatures 120°-180° F.

No. 43 for water temperatures 160°-220° F.

No. 44 for water temperatures 190°-240° F.

Regulators can be exposed to temperatures 30° higher than the above limits without injury, but should not be continuously operated at these high temperatures.

## Dimensions

Height 7 inches, diameter 5 inches, side tappings 1¼ inch std. I. P., lever bar 48 inches long, adjusting weights (2) 4½ lbs. each. Shipping weights complete with trimmings, 34 lbs.

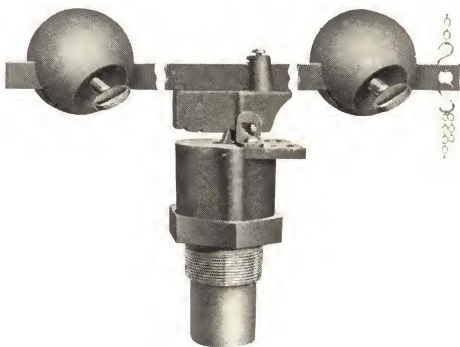
Shipped complete with 8 ft. chain, 8 ft. wire cable, 4 S-hooks, 2 ceiling pulleys, one lever bar and two adjusting weights.

List price .....each \$25.00

# Sylphon Water Temperature Regulators

NOS. 45, 45-A AND 45-B

For Damper Control of Water Boilers  
and Tank Heaters



No. 45

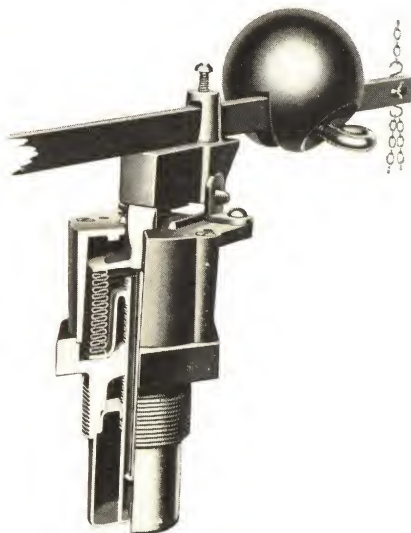
A simple accurate regulator which will control the draft so as to maintain a constant temperature of the water. Its all metal construction insures permanent service. Easy to install and positive in action. Great saver of fuel and labor.

Nos. 45, 45-A and 45-B are also used on hot water supply heaters. They prevent the water temperature from rising higher than necessary, insuring faucet water of even temperatures every hour of the day. They prevent the generation of steam with the subsequent disagreeable sputtering and blowing off when faucet is opened. Prevents fire going out when under check.

The Nos. 45-A and 45-B are identical in construction, the only difference being that they operate on different ranges of temperature as indicated.

### Data

No. 45 and 45-A for water temperatures 120°-202° F.  
No. 45-B for water temperatures.....100°-220° F.



No. 45A-45B

Nos. 45 and 45-A can be temporarily exposed to temperatures as high as 250° and No. 45-B to 230° F. without injury, but should not be operated continuously at these excessive temperatures.

### Dimensions

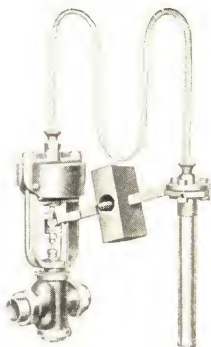
Hub of regulator on No. 45 is threaded 1½ inch std. I. P., length of hub 4 inches, while on Nos. 45-A and 45-B these dimensions are both 2 inches. Lever bar 48 inches long, adjusting weight (2) 4½ lbs. each. Shipping weight, complete with trimmings, 25 lbs.

Shipped complete with 8 feet of chain, 8 feet of wire cable, 4 S-hooks, 2 ceiling pulleys, 1 lever bar, and 2 adjusting weights.

List price .....each \$20.00

# Sylphon Temperature Regulators

For Controlling Temperature of Liquids



No. 930



No. 931

These regulators are for the control of steam heated supply tanks and insure a constant supply at even temperatures by eliminating the tendency to overheat. They are adjustable for delivery of temperatures as desired within a range of 40 degrees. The sensitive bulb is inserted in the tank and valve at a convenient point in the steam line. With setting adjusted as desired, the operation is entirely automatic.

No. 930 is made in lever weight counterbalance type and has valve sizes  $\frac{1}{2}$  to 8 inch inclusive.

No. 931 is furnished in spring counterbalance type and has valve sizes  $\frac{1}{2}$  to  $2\frac{1}{2}$  inches.

Regulator furnished complete with 8 feet of flexible tubing. Desired temperature and approximate steam pressure should be stated in ordering. Bulb length 16 inches.

## NO. 930 AND NO. 931

Size	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"	2 $\frac{1}{2}$ "
List 930 and 931	\$60	\$65	\$70	\$75	\$80	\$90	\$95
Shipping Weight 930	48	49	58	88	90	120	162
Shipping Weight 931	45	46	48	60	65	90	95
Size	3"	3 $\frac{1}{2}$ "	4"	5"	6"	8"	
List 930	\$100	\$110	\$120	\$200	\$225	\$275	
Shipping Weight 930	217	280	330	451	330	400	

# Thermostatic Automatic Heat Regulators



HONEYWELL REGULATOR  
Thermostat Model 8



MINNEAPOLIS REGULATOR  
Thermostat No. 35



MARVEL REGULATOR  
Thermostat with Time  
Attachment



## Regulators

A good regulator, such as listed on pages 138-142-144, keeps your home at an even temperature, saves coal, prevents destruction of property by fire and prolongs the life of a heater by always closing the draft before the fire gains too much headway. It relieves the mind entirely of the care of the draft damper, and the fear that at night, or during your absence for a few hours, there is danger to life and property through neglect of the heater. The generator demonstrates that no heating plant can be either efficient or complete without it. It controls equally well on Hot Water, Steam, Vapor, Vacuum, Gas, Hot Air and Combination Heaters.

Too much care cannot be used in the selection of your regulator, since a poor regulator is a detriment to the heating plant. Those listed on pages 138-142-144, in every detail, from design to artistic finish, reflect the high ideals founded upon fifty years of service and quality.

### HONEYWELL

Thermostat	No.	Spring Motor	Gravity Motor	No.	D. C. Motor	A. C. Motor
Plain	4	\$45.00	\$38.00	14	\$60.00	\$70.00
One Day	6	52.00	45.00	16	67.00	77.00
Eight Day	8	65.00	58.00	18	80.00	90.00

No. 3 Water Regulators.....	\$20.00
No. 3-A Water Regulators.....	20.00
Aquasta .....	20.00
Special Low Voltage Transformer.....	5.00

### MARVEL

Thermostat	No.	Motor	List
One Day	100	Battery .....	\$60.00
One Day	101	Battery .....	53.00
Plain	104	110 Volt 60 Cycle A.C. with Transformer .....	80.00
Plain	105	110 Volt 60 Cycle A.C. with Transformer .....	73.00
Eight Day	106	Battery .....	100.00
Eight Day	107	110 Volt 60 Cycle A.C. with Transformer .....	120.00

# Regulators

## MINNEAPOLIS

Ther- mostat	No.	Spring Motor	Grav. Motor	D.C. Motor	A.C. Motor	110 D.C. Motor	Ther- mostat only
Plain	40	\$45.00	\$37.00	\$60.00	\$70.00	\$70.00	\$21.00
One Day	47	52.00	44.00	67.00	77.00	77.00	28.00
Eight Day	55	64.00	56.00	79.00	89.00	89.00	0-5Rg. 40.00
Eight Day**	60	74.00	66.00	89.00	99.00	99.00	50.00
H. W. Tank	65	69.00	61.00	84.00	94.00	94.00	45.00
or Boiler	70	59.00	51.00	74.00	84.00	84.00	35.00
Pressurestat							

\*\*Square clock.

### MINNEAPOLIS MOTOR ONLY

Spring Motor with Spring Power, Switch Lever, Brackets, etc.....	\$24.00
A. C. 110 Volt, 60 Cycle, Alternating Current Motor with Switch Lever, etc.....	49.00
Gravity Weight Motor to attach to ceiling, no switch lever or brackets.....	16.00
D. C. 6 Volt, 4 Dry Cell, Motor.....	39.00
D. C. 110 Volt Motor (2 dry cells).....	49.00

### TRY-ME

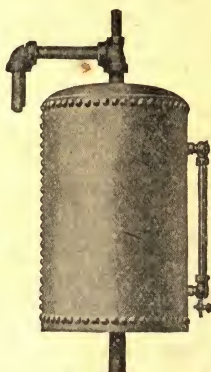


Size	¼	¾	½	¾	1	1¼	1½	2	2½
List	\$7.50	7.50	7.50	10.00	12.00	15.00	18.00	29.00	40.00

## Pierce Expansion Tanks

These tanks are made of refined boiler steel, riveted, caulked, galvanized and tested to 100 pounds pressure.

They are tapped top and bottom for 1 inch overflow and expansion pipe, and on side for 1/2 inch water gauge and 1 inch filling attachment.



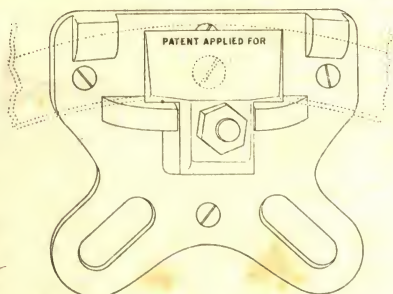
Number	Approx. Capacity Gallons	Approx. Size Inches	Radiation Sq. Ft.	List Price
0	8	10 x 20	250	7.50
1	10	12 x 20	300	8.00
3	15	12 x 30	500	9.00
5	20	14 x 30	700	12.50
6	24	14 x 36	800	13.00
7	26	16 x 30	950	14.00
8	32	16 x 36	1300	15.00
9	42	16 x 48	2000	16.50
10	66	18 x 60	3000	31.00
11	82	20 x 60	5000	37.00
12	100	22 x 60	6000	51.00
13	120	24 x 60	7500	58.00

The above prices are for Tank only.

Expansion Tank Water Gauge (bronzed), with two guards. Threaded for 1/2 inch pipe. Glass 5/8 x 12 inches.

Price .....\$2.60

## Sure Grip Expansion Tank Shelf



The Sure Grip Expansion Tank Shelf is a new design of shelf that will take the place of the old fashioned tank shelf at a saving of time and money. Each .....\$1.25

## Pierce Bronze and Liquid

	In ½-lb. Cans		In 1-lb. Cans	
	Single	10-lb.	Single	10-lb.
Pale Gold Bronze	\$ .50	\$ .45	\$ .75	\$ .70
Copper Bronze	.50	.45	.75	.70
Aluminum	.60	.55	.85	.80

Bronzing Liquid.....¼-Gal. \$1.05; ½-Gal. \$ .65; Gal. \$ .60  
Bronzing Brushes (½, 1, 1¼, 1½, 2" wide).....Per inch \$ .50

### Directions For Use

Allow 1 lb. gold bronze for each 300 sq. ft. radiation.

All ½ qt. bronze liquid to 1 lb. of gold bronze.

If a coat of priming paint (applied without oil) is used, only about one-half the above quantities will be required.

Do not have bronzing liquid uncorked when not in use, as exposed to the air it thickens and becomes worthless.

Do not get any bronze into the liquid can, as even a small quantity turns the liquid green.

Use a clean mixing can and a clean brush if good work is desired. Endeavor to cover surface with one stroke of brush if possible, and do not work it more than absolutely necessary.

Allow 1 lb. aluminum bronze for each 500 sq. ft. radiation.

Allow 1 gal. liquid to 1 lb. aluminum bronze.

## Boiler Cement

Neverleak is a liquid guaranteed to stop all ordinary leaks and cracks in any heating boiler; also in steam boilers below the water line, provided directions are followed and fire is maintained under boiler for not less than three hours after Neverleak has been used.

1 Quart Cans.....	each \$6.00
½ Gallon.....	each 10.00
1 Gallon.....	each 18.00

"X" Liquid Boiler Cement is an absolute liquid with a chemical affinity for water. When it is poured in the leaking water, it instantly combines with the water in the boiler. In sizzling through the leak or crack, it is changed by atmospheric oxygen from a liquid to a solid, thus stopping the leak or crack.

1 Quart Cans.....	each \$6.00
½ Gallon Cans.....	each 10.00

## Smooth-On Iron Cement

No. 1 hardens quickly.

No. 2 hardens slowly and is hydraulic.

Sold in powder form. Applied as putty by mixing with water. Becomes hard as iron. Packed in tins.

Some uses: Stops leaks of steam, water, fire, oil or gas in boilers, furnaces, stoves, radiators, pipes, tanks, water jackets, etc. Used on iron, brass, copper, aluminum, wood, etc.

### PRICES PER POUND

1 lb. ....	\$ .50	50 lb. Can, per lb..	\$ .32
5 lb. Can, per lb....	.44	100 lb. Can, per lb...	.29
10 lb. Can, per lb....	.39	6 oz. Can.....	.30
25 lb. Can, per lb....	.33		

## Black Asphaltum Paint

In single and 5-gal. cans, per gal.....\$1.25

## Pierce Pipe Joint Cement

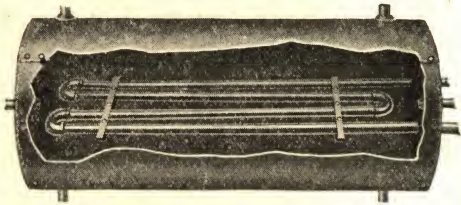
In pound cans, per can..... .25

## Pierce Thread Cutting Oil

In one gallon cans, per can..... 1.60



## Pierce Storage Tanks



Pierce storage tanks have both riveted and welded longitudinal seams and center girth seams which give them a maximum strength and tightness. On smaller sizes the shell is flanged over both heads and electrically welded. This is the most modern construction as it thus eliminates caulking by uniting the metals at the caulking edge. Unless otherwise specified when ordering, each standard and extra heavy storage tank has openings as shown, so placed that tanks may be installed either in a vertical or horizontal position. The illustration shows method of placing coils in tank—a positive, non-leakable connection by means of using stuffing boxes in place of the old style locknuts. This construction also facilitates the removal or replacement of coil in any tank equipped with manhole. Tanks ordered with handhole or manhole have same placed in head unless otherwise specified. Orders for tanks with coils, manholes, handholes, special openings, also galvanized tanks are special and, as such, are not subject to cancellation after work has been started.

Pierce standard tanks are tested to 100 lbs. and guaranteed for 65 lbs. working pressure; extra heavy are tested to 150 lbs. and guaranteed for 100 lbs. pressure.

Coils listed below are of 4-pipe return bend type for horizontal installation. Spiral coils for vertical installations and brass and copper coils quoted on application.

Handholes in head or shell (4"x6").....	\$ 7.00
Manhole in head (10"x15").....	30.00
Manhole in shell (10"x15").....	45.00
Flanges, 2" or 2½", each.....	7.00
Flanges, 3" or 3½", each.....	8.00
Flanges, 4", each.....	9.00
Galvanizing, per cwt.....	10.00
Cast iron tank legs per set of 3.....	3.00



## Standard Steel Storage Tanks

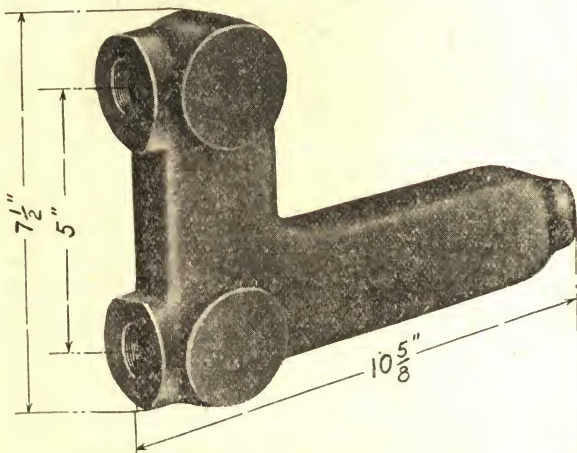
Cap'y Gals.	Size In. Ft.	App. Wt.	Size Op'gs	List Price	Coil Size	Blk. Coil	Galv. Coil
66	20x 4	235	1½	\$55.00	1	\$20.00	\$25.00
85	20x 5	275	1½	60.00	1	22.00	27.00
100	24x 4	315	1½	65.00	1¼	25.00	30.00
120	24x 5	375	1½	72.00	1¼	26.00	31.00
140	24x 6	425	1½	80.00	1¼	28.00	33.00
150	30x 4	460	2	85.00	1¼	25.00	30.00
180	30x 5	525	2	92.00	1¼	26.00	31.00
220	30x 6	600	2	98.00	1¼	28.00	33.00
250	30x 7	650	2	118.00	1¼	29.00	35.00
295	30x 8	725	2	125.00	1½	30.00	38.00
345	36x 6	750	2	120.00	1½	35.00	44.00
365	36x 7	850	2	145.00	1½	38.00	46.00
420	36x 8	925	2	155.00	1½	40.00	50.00
525	36x10	1075	2	167.00	1½	45.00	55.00
575	42x 8	1200	2	200.00	1½	40.00	50.00
720	42x10	1350	2	220.00	1½	45.00	55.00
865	42x12	1500	2	245.00	1½	49.00	58.00
1000	42x14	1700	2	280.00	1½	55.00	65.00

## Extra Heavy Storage Tanks

Capacity Gallons	Size In. Ft.	Approx. Weight	Size Openings	List Price
120	24x 5	400	1½	\$80.00
140	24x 6	450	1½	90.00
180	30x 5	530	2	108.00
220	30x 6	625	2	115.00
250	30x 7	675	2	135.00
295	30x 8	750	2	145.00
315	36x 6	950	2	145.00
365	36x 7	1075	2	160.00
420	36x 8	1175	2	170.00
525	36x10	1400	2	210.00
430	42x 6	1225	2	195.00
500	42x 7	1350	2	220.00
575	42x 8	1475	2	240.00
720	42x10	1725	2	265.00
865	42x12	2000	2	300.00
1000	42x14	2250	2	345.00
750	48x 8	1800	2	290.00
940	48x10	2100	2	330.00
1130	48x12	2400	2	365.00
1300	48x14	2675	2	400.00

Use price on next larger size tank to determine cost of tanks not listed.

## Pierce Hot Water Coil Section



We do not recommend the use of a pipe coil in a fire-box. Household hot water requirements can usually be more satisfactorily taken care of through a water jacket heater, connected at the side of the boiler or through a separate hot water supply boiler. However, there are conditions under which a coil may be satisfactory and for such we are prepared to furnish a water coil section similar to the one illustrated, and every Pierce surface burning boiler has an opening in its firepot for such a coil section.

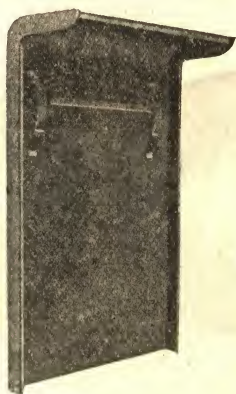
These coil sections are made of cast iron. They can be placed in a vertical, horizontal or side position, in or over the fire of the heater, with galvanized iron circulating pipes connecting with the range boiler.

The section is tapped  $\frac{3}{4}$  inch either in end, as shown, or in the side. The tappings bring the connecting pipes evenly through the cored holes in the wall of fire pot.

In ordering state whether side or end tappings are wanted.

List .....\$6.00

# Improved Radiator Shields



## LIST PRICES

No. Sections in Radiator 2½" Centers	Plain Steel	Gold, Copper, Aluminum, Bronze or Black Iron Finish	Antique Copper Finish
8	\$9.80	\$11.20	\$14.00
9	10.25	11.75	14.70
10	10.70	12.30	15.40
11	11.15	12.85	16.10
12	11.60	13.40	16.80
13	12.05	13.95	17.50
14	12.50	14.50	18.20
15	12.95	15.05	18.90
16	13.40	15.60	19.60
17	13.85	16.15	20.30
18	14.30	16.70	21.00
19	14.75	17.25	21.70
20	15.20	17.80	22.40
21	15.65	18.35	23.10
22	16.10	18.90	23.80
23	16.55	19.45	24.50
24	17.00	20.00	25.20
25	21.20	25.55	32.40
26	21.65	26.10	33.10
27	22.10	26.65	33.80
28	22.55	27.20	34.50
29	23.00	27.75	35.20
30	23.45	28.30	35.90

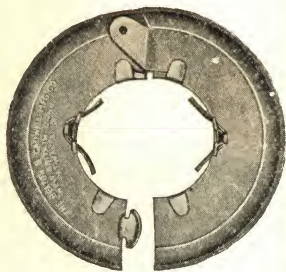
All shields are supplied with our special equipment for installing. When radiators are placed more than 3 inches from wall it will be necessary to advise in order that special equipment for installing may be supplied.

# Floor and Ceiling Plates

## Pebco Type



Top



Bottom

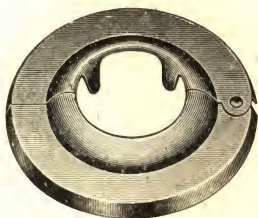
These Plates may be placed upon the pipe after the pipe is in position, the hinge and catch being invisible when plate is closed, giving the appearance of a solid plate. The plate is perfect in finish, being heavy stamped steel, nickeled on copper and highly polished. It is held firmly to the pipe by four jaws stamped to conform to the pipe.

### SIZES AND LIST PRICES

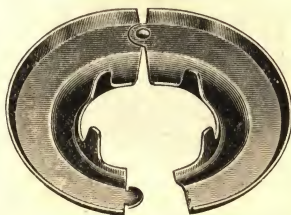
Sizes	Black	Nickel
1/4"	\$ .14	\$ .25
3/8"	.15	.26
1/2"	.16	.27
3/4"	.17	.28
1"	.20	.32
1 1/4"	.22	.35
1 1/2"	.25	.38
2"	.30	.45
2 1/2"	.50	.65
3"	.65	.80
3 1/2"	.80	1.00
4"	1.00	1.25
4 1/2"	1.25	1.50
5"	1.50	1.75
6"	1.75	2.00

# Floor and Ceiling Plates

## Ajax Type



Top



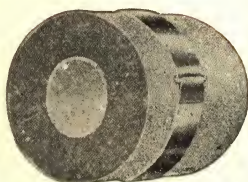
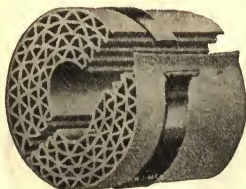
Bottom

These plates are strongly built and have long, stiff tapering fingers which hold the plate firmly on the pipe.

Sizes	Black	Nickel
$\frac{1}{2}$ "	\$ .16	\$ .27
$\frac{3}{4}$ "	.17	.28
1"	.20	.32
$1\frac{1}{4}$ "	.22	.35
$1\frac{1}{2}$ "	.25	.38
2"	.30	.45
$2\frac{1}{2}$ "	.50	.65
3"	.65	.80
$3\frac{1}{2}$ "	.80	1.00
4"	1.00	1.25



## Pierce Insulating Materials



**Standard Hair Felt.** Furnished in rolls of 300 square feet each in 3 and 6 foot widths.

Thickness, Inches	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2
List Price						
Per Square Foot....	\$ .055	\$ .065	\$ .085	\$ .10	\$ .15	\$ .19

**Asbestos Roll Fire Felt.** A soft, flexible felt of asbestos fibre. May be wrapped around pipes where there is not room for sectional insulation. In rolls 3 feet wide containing 100 square feet.

Thickness, Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{4}$	$\frac{3}{4}$
List Price					
Per Square Foot.....	\$ .16	\$ .20	\$ .26	\$ .30	\$ .50

**Asbestocel Sheets.** 1 ply corrugated asbestos paper sheets in rolls 3 feet wide containing approximately 250 square feet.

Per square foot.....\$ .10

**85% Magnesia in Blocks.** 3x18 inches and 6x36 inches from  $\frac{1}{2}$  to 4 inches thick.

## Pierce Asbestos Wicking

In balls from  $\frac{1}{4}$  lb. to 1 lb. each.

Number	0	1	2	3
List Price per Gross.....	\$1.25	\$1.75	\$2.50	\$3.70



## Pierce Asbestos Millboard

We can furnish the above in sheets 40x40 or 42x44 inches, from  $\frac{1}{32}$  to  $\frac{1}{2}$  inch thick.

Greater thickness and all other sizes made to order.

## Pierce Sectional Pipe Insulation

**Improved Asbestocel.** Made of asbestos cells cemented together in alternate plain and corrugated layers. The corrugations intersect at right angles forming a multitude of dead air cells which prevent the longitudinal circulation of air. This construction saves heat and adds strength to the insulation. Furnished 2 to 6 ply (approximately  $\frac{1}{2}$  to  $1\frac{1}{2}$  inch thicknesses). For 1 inch and less, use standard list.

**85% Magnesia.** Made of carbonate of magnesia and asbestos so combined that multitudes of minute dead air cells are formed, providing light weight and extra strength as well as greater insulating efficiency. Made in thicknesses from standard (approximately 1 inch) to 3 inches.

**Zero.** Cold water pipe insulation constructed of a layer of 1 inch hair felt surrounded by several layers of wool felt and with a layer of saturated wool felt inside the hair felt. Furnished in one thickness (approximately  $1\frac{1}{4}$  inches).

**Wool Felt.** Made of wool felt lined with asbestos felt.

# Sectional Pipe and Fitting Coverings

## STANDARD THICKNESS

Inside Diam. of Pipe Inches	List per Lineal Ft.	Elbows 90or45°	Tees	Crosses	Globe Valves	Flange Covers
½	\$ .22	\$ .30	\$ .36	\$ .48	\$ .54	\$ .50
¾	.24	.30	.36	.48	.54	.50
1	.27	.30	.36	.48	.54	.50
1¼	.30	.30	.36	.48	.54	.50
1½	.33	.30	.36	.48	.54	.50
2	.36	.36	.42	.54	.60	.60
2½	.40	.42	.48	.60	.78	.70
3	.45	.48	.54	.70	.96	.80
3½	.50	.54	.60	.80	1.20	.90
4	.60	.60	.75	.95	1.50	1.00
4½	.65	.72	.90	1.10	1.85	1.30
5	.70	.90	1.20	1.50	2.25	1.60
6	.80	1.30	1.60	2.00	2.80	1.90
7	1.00	1.80	2.20	2.80	3.60	2.20
8	1.10	2.40	3.00	3.60	4.40	2.50
9	1.20	3.00	3.80	4.40	5.30	2.90
10	1.30	3.60	4.60	5.20	6.20	3.30

All sectional pipe covering is furnished in 3 -ft. sections, to fit standard size pipe, with canvas jacket and brass-lacquered bands. In order to eliminate possibility of damage in transit or in the shop and to expedite delivery with necessary bands, we recommend ordering in the following crate quantities:

Size, Inches	1	1¼	1½	2	2½	3	4
Lts. per Crate.....	145	105	90	66	50	45	27
Ft. per Crate.....	435	315	270	198	150	135	81

## Pierce Cement

85% Magnesia, in bags of 60 lbs. each, per bag..\$5.00  
 Asbestos, in bags of 100 lbs. each, per bag..... 5.00

To apply Pierce cement, the surface of the boiler should be warm. It should be mixed with water and can be applied with a trowel and finished with a wet brush. Each bag of the above is sufficient to cover 40 square feet with a 1 inch layer of insulation. We give below an estimate of Pierce asbestos cement necessary to cover 1¼ inch thick the Pierce line of boilers.

### American Boilers

No. of Boiler	Lbs.
S or W 214 and 215.....	300
216, 217, 265 and 266.....	400
267, 268, 325, 326, 327, 405 and 406.....	500
328, 329, 3210 and 407.....	600
408 .....	700
409, 4010, 466 and 467.....	800
4011, 468 and 469.....	900
4610 .....	1000
4611 .....	1100
4612 .....	1200
4613 .....	1300

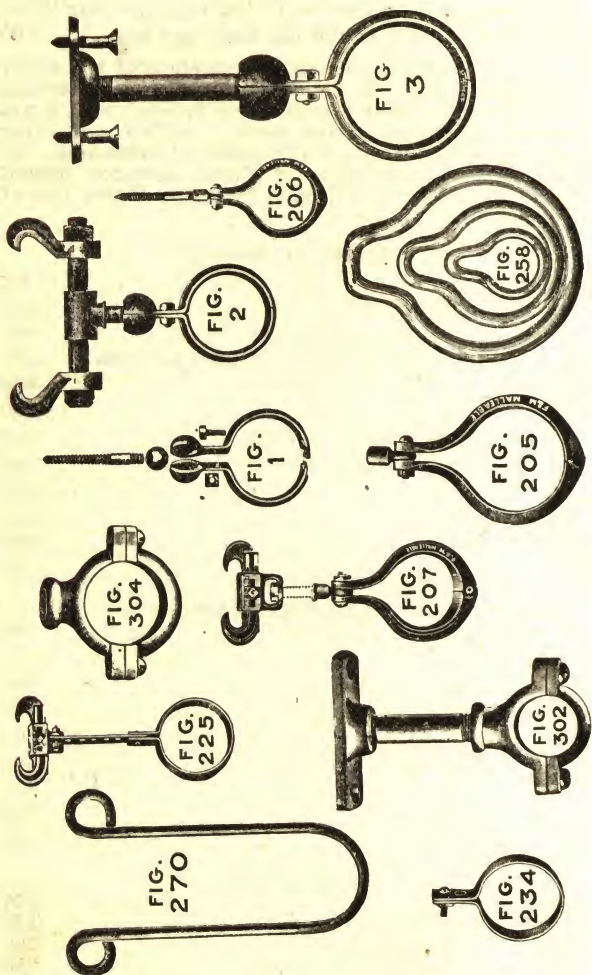
### Down Draft Boilers

S or W 844 .....	300
845 .....	350
846 .....	400
847 .....	450
848 .....	500
849 .....	550
8410 .....	650
8411 .....	700
8412 .....	750

### Pebco Boilers

S or W 313 .....	100
914, 923 and 924.....	150
933, 934 and 935.....	200
943, 944, 945 and 953.....	250
954 and 955.....	300

# Iron Pipe Hangers



# Iron Pipe Hangers

## LIST PRICES

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Fig. 205 Each	\$ .10	\$ .12	\$ .12	\$ .14	\$ .16	\$ .18	\$ .22
Fig. 206 "	.15	.18	.18	.20	.22	.25	.30
Fig. 207 "	.55	.58	.58	.60	.62	.65	.70
Size of Lag "	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Fig. 225 "	.50	.53	.55	.58	.60	.62	.80
Fig. 234 "	.14	.14	.16	.18	.20	.22	.24
Fig. 258 "		.10	.13	.15	.18	.20	.23
Fig. 270 "		.15	.16	.18	.21	.24	.30
Fig. 302 "	.22	.27	.32	.35	.40	.50	.70
Fig. 304 "	.15	.18	.22	.27	.35	.40	.45
Tapped for "	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
No. 1 "	.15	.18	.18	.20	.22	.25	.30
No. 2 "	.55	.58	.58	.60	.62	.65	.70
No. 3 "	.30	.33	.33	.35	.37	.40	.55

Size	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	
Fig. 205 Each	\$ .28	\$ .43	\$ .53	\$ .58	\$ .63	\$ .82	
Fig. 206 "	.35	.50	.60	.65	.70	.90	
Fig. 207 "	.95	1.10	1.20	1.25	1.35	1.50	
Size of Lag "	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	
Fig. 225 "	.82	.84	.86	.88	.92	1.15	
Fig. 234 "	.26	.30	.32	.34	.36	.40	
Fig. 258 "	.25	.28	.30	.	.35	.40	
Fig. 270 "	.36	.42	.48				
Fig. 302 "	.90		1.10		1.40	1.90	
Fig. 304 "	.50		.65		1.00	1.50	
Tapped for "	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{3}{4}$	$\frac{3}{4}$	
No. 1 "	.35	.50	.60		.70	.90	
No. 2 "	.75	.90	1.00		1.10	1.30	
No. 3 "	.62	.83	.98		1.17	1.40	

Fig. 205 is hinged, and therefore easily adjusted.

Fig. 206 has lag screw, gimlet pointed.

Fig. 207 has adjustable clamp fitting beam flanges from 3 to 7 inches.

Fig. 225 price is complete with 6 inches of bar. Clamp will fit beams from 3 to 7 inches and is made extra heavy for larger sizes.

Fig. 258 can be furnished wrought iron if desired.

Fig. 302 has  $\frac{1}{4}$ x4 nipples, although other lengths will be supplied on order.

The lag on No. 1 is made to correspond with sizes of pipe and can be lengthened to any required distance with a coupling and a piece of pipe. Nipples on Nos. 1 and 3 are furnished 5 inches long and can be lengthened or shortened in a like manner. In ordering No. 2 hangers, state size of iron beams.

Above prices apply to plain black hangers only. Prices for other finish or figure numbers furnished on application.

Perforated Band Iron No. 1 for use with Fig. 234, or as a hanger in itself. Furnished in 5-ft. lengths.

$\frac{1}{2}$ " to  $1\frac{1}{2}$ " in width, per ft.....\$ .10



## Pop Safety Valve



For Use on Heating Boilers  
Where Steam Pressure  
Does Not Exceed  
30 Pounds

This is the pop safety valve we furnish with all steam boilers unless otherwise ordered.

The base of the valve is built to stand abuse through the improper use of Stillson or other wrenches when installing, and the threads are accurately cut.

The cover is sealed and the set pressure cannot be altered without breaking the seal. The law in some states\* requires absolute non-adjustment and this safety valve will be furnished non-adjustable when so ordered.

It is set at 10 or 15 lbs. for low pressure boilers. At 1 or 2 lbs. for vapor systems.

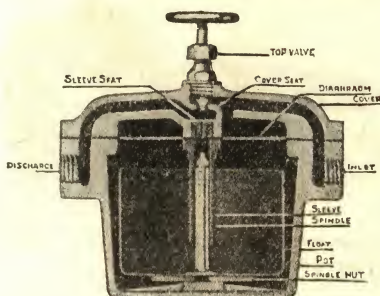
### LIST PRICES

	1"	1¼"	1½"	2"	2½"
Pop Safety Valves, Black....	\$1 75	\$1.90	\$2.25	\$3 00	\$4.60
Pop Safety Valves, Brass....	2.10	2.25	2.60	3.35	4.95
Pop Safety Valves, Vapor....	2.30	2.45	2.80	3.55	5.15
Police Safety Valves, Mass. Std. ....	1.75	1 95	2.25	3 05	7.40

\*Massachusetts, Ohio, Pennsylvania, Province of Ontario, Can.



# Nason Steam Trap



Sectional View

- |                 |  |
|-----------------|--|
| K—Top Valve     | F—Sleeve   |
| *L—Center Cover | H—Spindle  |
| G—Main Cover    | E—Sleeve Seat                                      |
| C—Diaphragm     | Cover Seat (not indicated) is seat for Top Valve K |
| B—Pot           |  |
| D—Float         |  |

The function of these traps is to receive and automatically discharge the condensation from heating surfaces of every description without loss of pressure or waste of steam.

All parts of these traps are interchangeable and duplicates can be supplied promptly.

## SIZES, DIMENSIONS, CAPACITIES, ETC.

No.		1	2	3	4	5
Pipe Connections	Ins.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Diameter Flange	"	$10\frac{3}{4}$	$14\frac{1}{4}$	$15\frac{3}{4}$	19	$24\frac{1}{4}$
Diameter Cylinder	"	8	$10\frac{1}{2}$	12	14	18
Height over Valve	"	11	14	$16\frac{1}{4}$	$18\frac{1}{2}$	$23\frac{1}{2}$
Height over Cover	"	8	10	12	14	$15\frac{1}{2}$
Lineal Feet 1 inch pipe		1500	3450	5250	7650	12000
Square Feet Surface		500	1150	1750	2550	4000
Discharge lbs. Water						
per Min.		$4\frac{1}{2}$	$6\frac{1}{2}$	10	$15\frac{1}{2}$	23
Weight, Class B, C Lbs.		40	80	113	176	336
Weight, Sidelug	"	47	92	125	212	343

## PRICES, EACH

Class B—for pressure between 1 and 20 lbs.	\$26.50	\$56.50	\$72.50	\$108.50	\$211.50
Class C—for pressure between 20 and 70 lbs.	26.50	56.50	72.50	108.50	211.50

\*No. 4 and 5 only.

## Automatic Water Feeder

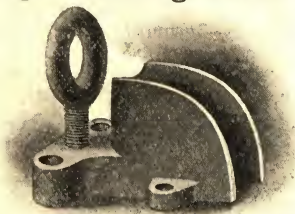


For automatically controlling the water level of low pressure heating boilers.

### MEASUREMENTS

Length .....	24 inches
Height .....	12 "
Width .....	9 "
Size of boiler connection.....	1 "
Size of gauge glass connection.....	1/2 "
Size of feed inlet.....	3/4 "
List price.....	\$20.00

## Pipe Bending Form



This Bending Form makes a handy and indispensable fixture for a pipe bench. Will not get out of order; will last a lifetime. Has bolt holes so that it can be readily attached to bench. With this form, pipe can be straightened, or an offset or quarter bend easily made. It is as necessary to a pipe bench as a vise. Made in two sizes, and has extension eye bolt so that the pipe is held close to form, insuring a close and accurate bend.

No. 1 takes 1/8 to 1 1/4 inch pipe; weight, 11 lbs.	
List price .....	\$3.50
No. 2 takes 1 to 2 inch pipe; weight, 21 lbs.	
List price .....	4.50

## Radiator Wrenches

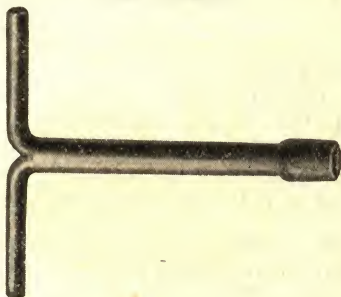
### Indirect Wrench



Drop forged steel, made to fit hexagon on 2 in.  
R. & L. nipples.

List price .....\$5.00

### Nut Wrench



List price .....\$3.00

### Spud Wrench



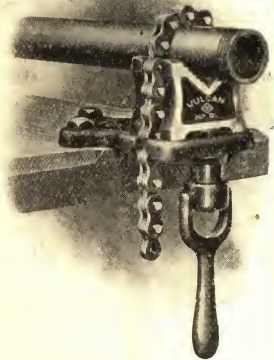
List price .....\$1.50

# Pipe Tools

## Vulcan Chain Pipe Vise

For Pipe, Bolts, Bars, Shafts, Etc.,  $\frac{1}{8}$  to 8 Inch Diameter

These Vises are unbreakable, compact, rapid in action and positive in grip. All are equally serviceable upon and suitable for fastening to bench or post. The smaller sizes are well adapted for carrying by hand or in tool bag.



Adjustment is quickly effected by engaging the projecting rivets of the chain, with a series of stepped bosses on the base, when the pipe may be instantly locked in an unbreakable grip by a turn of the handle.

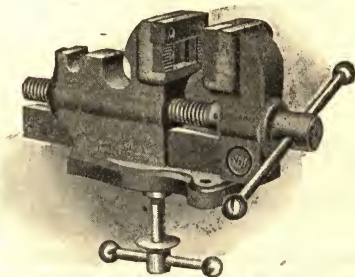
They are made entirely of wrought steel, with drop-forged jaws saw-tempered for file-sharpening. The chains are of the same quality as those of "Vulcan" Chain Pipe Wrenches; all parts are fully guaranteed.

No.	For Sizes Pipe,	Price, Vise and Extra Parts					
		Jaws, Pair	Chain with Screw	Screw	H'dle and Nut	Nut	Vise Com- plete
1	$\frac{1}{8}$ to 2	\$1.50	\$1.25	\$0.40	\$1.10	\$0.70	\$3.50
2	$\frac{1}{4}$ to 4	3.50	2.40	.70	2.10	1.35	7.50
4	$\frac{3}{4}$ to 8	9.00	6.00	1.25	3.50	2.00	18.00



# Pipe Tools

## Combination Bench Pipe Vise



Three Combinations in One, Constructed with  
Steel Sliding Bar

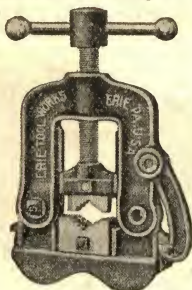
Holds pipe from  $\frac{1}{8}$  inch to 10 inches, with Bending Forms for bending pipe up to 2 inches.

A combination pipe vise, to be useful and practical, must admit of each part of the combination being independent of the other. The combinations in the "Combination Vise" are independent of each other and do not conflict. It is a perfect vise, and has more advantages than any other vise on the market. It is strongly made, and the parts made to duplicate, and will give satisfaction. The Sliding Bar, Screws, Handles and Jaws are made of steel, and all the parts have been put to, and have stood the severest tests.

- No. 0. Holds pipe from  $\frac{1}{8}$  to  $2\frac{1}{2}$  inches, with bending form for bending pipe up to 1 inch.
- No. 1. Holds pipe from  $\frac{1}{8}$  to 7 inches, with bending form for bending pipe up to  $1\frac{1}{2}$  inches.
- No. 3. Holds pipe from  $\frac{1}{8}$  to 10 inches, with bending form for bending pipe up to 2 inches.
- No. 0. Combination Bench Vise, weight 40 lbs. List price, \$15.00
- No. 1. Combination Bench Vise, weight 90 lbs. List price, 20.00
- No. 3. Combination Bench Vise, weight 160 lbs. List price, 30.00

## Pipe Tools

### Holland Malleable Hinged Pipe Vise

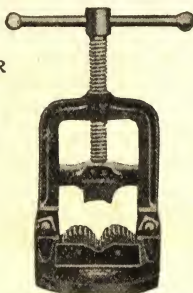


The base is flat with all bracing flanges underneath, making it convenient to use a wrench in fastening with lag screws or bolts.

Number	402	403	404
Pipe Capacity, inches	$\frac{1}{8}$ to $2\frac{1}{2}$	$\frac{1}{8}$ to $3\frac{1}{2}$	$\frac{1}{8}$ to 4
Price	\$5.00	\$7.50	\$11.00
Extra Jaws, per set of three	1.75	2.50	3.50

### Keystone Self-Locking Malleable Pipe Vise

WITH ROLLER  
PIPE JAWS



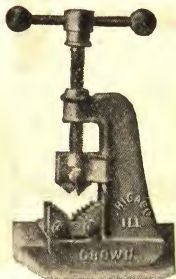
The roller jaw feature gives a much larger gripping surface than V jaws and will not bend or mar the pipe. Self-locking latch may be used on either side.

Number	RL	RRL	SL 3
Pipe Capacity, inches	$\frac{1}{8}$ to $2\frac{1}{2}$	$\frac{1}{4}$ to 3	$\frac{3}{4}$ to 4
Price, each	\$5.00	\$7.20	\$10.00
Extra Jaws, per set of three	1.80	2.40	3.20



## Pipe Tools

### Crown Pipe Vises



No. 2 Bench Pipe Vise



No. 0 Post Pipe Vise

#### LIST PRICE

No. 2 Bench Vise, $\frac{1}{8}$ in. to 2 in. pipe.....	\$6.00
No. 0 Post Pipe Vise with 3 feet chain.....	7.00
For Pipe $\frac{1}{8}$ to 1 inch inclusive	
No. 2 Post Pipe Vise with 3 feet chain.....	9.00
For Pipe $\frac{1}{8}$ to 2 inches inclusive	
Complete with fastening attachment	

Extra Upper Jaws.....\$ .70

Extra Lower Jaws, set of 2..... 1.50

Prices for longer lengths of welded chain on application.

## Hall Pipe Reamers

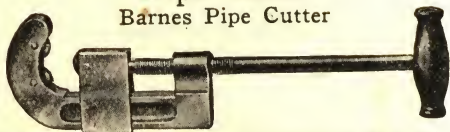


For Removing the Burrs from Ends of Wrought Pipe

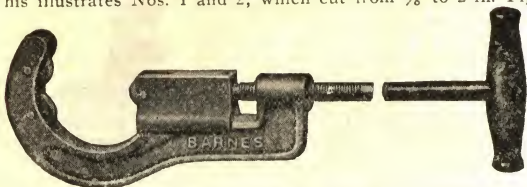
Number	1	2
Reams Pipe, Inches	$\frac{1}{8}$ to 1	$\frac{3}{4}$ to 2
Each	80	.90

## Pipe Tools

### Barnes Pipe Cutter



This illustrates Nos. 1 and 2, which cut from  $\frac{1}{8}$  to 2 in. Pipe



This illustrates Nos. 3, 4, 5, 6,  $6\frac{1}{2}$  and 7, which cut from  $1\frac{1}{2}$  in. to 12 in. Pipe

The best material used throughout.

The cutter wheels are drop forged from Jessop's best tool steel.

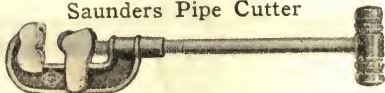
#### PRICE LIST

Barnes Cutters and Repair Cutting Pipe From  $\frac{1}{8}$  Inch to 12 Inches in Diameter

Size of Cutter	Size of Pipe	Pipe Cutter	Cutter Wheels	Wheel Pins, Per Doz.	Hooks	Slides	Nuts	Handles	Approx. Weights
No. 1	$\frac{1}{8}$ to 1	\$4.50	.25	\$1.00	\$1.75	\$0.75	\$0.25	\$1.00	3 lbs.
No. 2	$\frac{1}{4}$ to 2	6.00	.30	1.00	2.60	1.00	.25	1.25	5 lbs.
No. 3	$1\frac{1}{2}$ to 3	10.00	.40	1.00	4.55	2.00	*	2.25	9 lbs.
No. 4	$2\frac{1}{2}$ to 4	20.00	.50	2.00	9.50	4.50	*	4.50	14 lbs.
No. 5	4 to 6	30.00	.75	2.00	13.75	7.00	*	7.00	23 lbs.
No. 6	6 to 8	40.00	.75	2.00	20.00	8.50	*	9.25	28 lbs.
No. $6\frac{1}{2}$	8 to 10	45.00	.75	2.00	23.00	9.50	*	10.25	34 lbs.
No. 7	9 to 12	50.00	.75	2.00	25.00	11.25	*	11.50	51 lbs.

\*Nut and hook in one piece in these sizes.

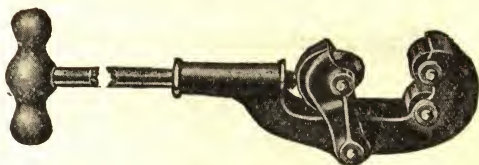
### Saunders Pipe Cutter



	Cuts Pipe from, inches	Price, Each	Extra Wheels, Each	Extra Block & Wheel, Each	Extra Rollers, Each	Extra Pins, Each
No. 1.....	$\frac{1}{8}$ to 1	\$ 3.00	\$ .24	\$1.25	\$ .24	\$ .10
No. 2.....	1 to 2	4.50	.32	1.75	.32	.10
No. 3.....	2 to 3	11.00	.60	2.75	.50	.15
No. 4.....	$2\frac{1}{2}$ to 4	18.00	.60	3.50	.50	.15
No. 5.....	4 to 6	28.00	.60	4.00	.60	.15

# Pipe Tools

## Pipe Cutters



No. 1 Cutter

### LIST PRICES

No. 1 Cutter, each.....	\$ 4.00
Capacity $\frac{1}{8}$ in. to 1 in. pipe	
No. 2 Cutter (1 wheel) each.....	6.00
Capacity $\frac{1}{2}$ in. to 2 in. pipe	
No. 2 Cutter (1 wheel with extra handle), each	6.50
Capacity $\frac{1}{2}$ in. to 2 in. pipe	
No. 3 Cutter (1 wheel) including extra $\frac{3}{4}$ in. handle, each.....	19.00

## Crown Pipe Cutter Wheel

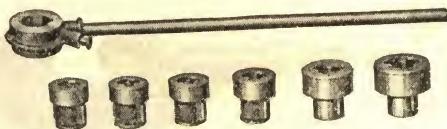


### LIST PRICES

No. 1 Cutter Wheel, each.....	\$ .60
No. 2 Cutter Wheel, each.....	.80
No. 3 Cutter Wheel, each.....	1.10

# Pipe Tools

## No. 3 Beaver Jr. Ratchet



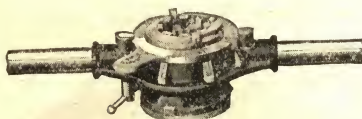
$\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and 1 inch

If you have a hundred other tools—you need this one.

The No. 3 Beaver Jr. will cut threads on the job where there is an inch or two space. Most fitters buy the tool complete  $\frac{1}{4}$  to 1-inch, but we'll sell you the ratchet handle and any die heads you need  $\frac{1}{8}$  to 1-inch inclusive. Simple and unbreakable—frame and guides in one piece and die chasers easily removed to grind or replace.

Name	Threads	List
Beaver Jr. Complete.....	$\frac{1}{4}$ to 1 inch	\$21.00
Beaver Jr. Complete.....	$\frac{3}{8}$ to 1 inch	18.00
Ratchet Handle only.....		4.00
1-in. Head, Complete with Dies.....		4.00
$\frac{3}{4}$ or $\frac{1}{2}$ -in. Head, Complete with Dies.....		3.50
$\frac{3}{8}$ - $\frac{1}{4}$ - $\frac{1}{8}$ -in. Head, Complete with Dies.....		3.00
Extra Dies, only (4 chasers) any size, per set		2.50

## No. 6 Beaverette



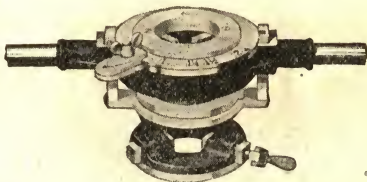
$\frac{1}{4}$  to  $\frac{3}{4}$  inch

This remarkable little Die Stock has proven its popularity by constantly increasing sales in the 12 years it has been on the market. It is the only tool manufactured threading  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  without changing dies or bushings. The two sets of dies necessary to cover this range are operated by one handle; simply set to the size required and the thread may be cut in less time than it takes to change dies in other tools. Left-hand dies or extra  $\frac{1}{8}$ -inch die can be substituted when required.

Name	Threads	Weight	List
No. 6 Beaverette.....	$\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$	8½ lbs.	\$15.00
Extra Dies, right or left ( $\frac{1}{8}$ ) ( $\frac{1}{4} \times \frac{3}{8}$ ) or ( $\frac{1}{2} \times \frac{3}{4}$ ) per set			3.00

# Pipe Tools

## No. 25 Beaver 1 to 2-Inch



The Standard 2-inch Die Stock for three good reasons:

1st—Good threads on all pipe.

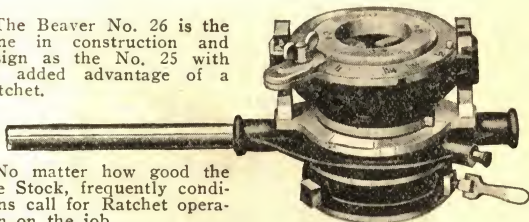
2nd—Easy cutting—2-inch easy as 1-inch because of the receding principle—the further the thread is cut the easier is the labor.

3rd—Saves time changing dies—one set cuts all sizes—no guides to change.

The No. 25 Beaver is an investment that pays for itself quickly.

## No. 26 Beaver Ratchet 1 to 2-Inch

The Beaver No. 26 is the same in construction and design as the No. 25 with the added advantage of a Ratchet.



No matter how good the Die Stock, frequently conditions call for Ratchet operation on the job.

The No. 26 is indispensable because two handles are furnished so it may be used as a straight Die Stock or Ratchet as desired.

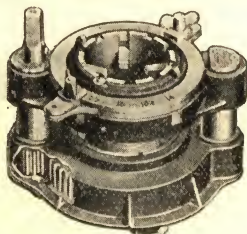
Threading dies are interchangeable in Nos. 25 and 26 Beavers. We have them in stock for immediate requirements and the cost is low—one set cuts all sizes.

Name	Threads	Weight	List
No. 25 Plain	1, 1¼, 1½, 2-inch	22	\$30.00
No. 26 Ratchet	1, 1¼, 1½, 2-inch	27	35.00
Extra Dies	1, 1¼, 1½, 2-inch	per set	3.50



## Pipe Tools

### No. 41 Beaver $2\frac{1}{2}$ to 4-Inch

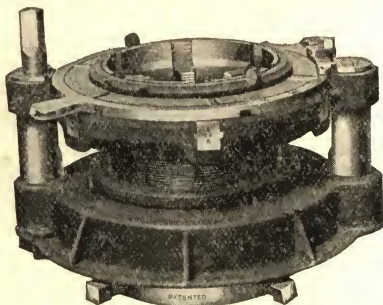


The No. 41 Beaver, threading  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$  and 4-inch pipe (without changing dies), is the smallest of the series of large geared Beavers.

It is operated on the same Beaver receding-die principle as the smaller tools, but a gear drive assists in reducing power, so that one man easily threads 4-inch pipe.

List price complete \$110.00. Extra dies, one set, threading  $2\frac{1}{2}$  to 4-inch, list \$9.00. Weight 99 lbs.

### No. 61 Beaver $2\frac{1}{2}$ to 6-Inch



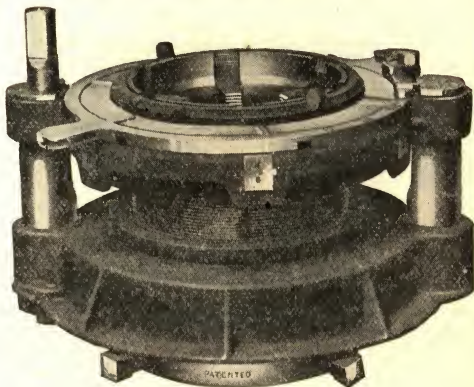
The No. 61,  $2\frac{1}{2}$  to 6-inch Beaver uses 2 sets of dies to cover the large range. Many large contractors have adopted this machine as standard equipment. No. 61 is a strictly one-man tool—bronze bushed throughout and made for heavy service.

Complete list \$220.00. Dies  $2\frac{1}{2}$  to  $3\frac{1}{2}$  or 4 to 6 inch, \$14.00. Weight 185 lbs.



## Pipe Tools

### No. 80 Beaver Geared $4\frac{1}{2}$ to 8-Inch



These two largest sizes—No. 80, threading  $4\frac{1}{2}$  to 8-inch, and No. 90, threading 9 to 12-inch—are practically alike in design and construction. Two sets of dies, only, are used in each tool—and we guarantee that one man can thread any size pipe up to 12-inch.

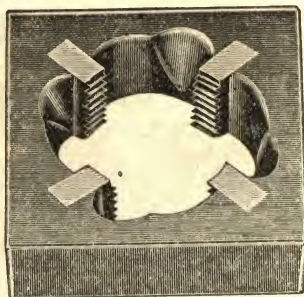
Like other Beavers, these sizes are adjustable to cut standard, oversize or undersize threads, and the dies can be thrown open instead of backing off over the finished thread. A malleable jacket covers the gears, thus protecting the workman as well as the tool itself. Driving pinion is supported at both ends, insuring strength and rigidity. All bearings are bronze bushed.

In the shop, these large Beavers do easier and faster work than ordinary hand machines. On outside work, the light weight allows their use right on the job, effecting a vast saving over moving the pipe to a stationary machine.

No.	Threads	Weight	List Price
80.....	$4\frac{1}{2}$ , 5, 6, 7, 8-inch	192	\$300.00
90 not illustrated...	9, 10, 11, 12-inch	233	500.00
Extra Dies, No. 80 ( $4\frac{1}{2}$ , 5, 6) or (7, 8).....			\$20.00
Extra Dies, No. 90 (9, 10) or (11, 12).....			30.00

# Pipe Tools

## Crown Dies



Crown Dies are not only a saving in time, but are more perfect in workmanship than other cheaper dies. These dies will cut a perfect thread and outlast all ordinary pipe dies. They will fit any solid stock.

### LIST PRICES, EACH

Size block  $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4}$  for No. 1 Stock

1 inch.....	\$3.00	$\frac{3}{8}$ inch.....	\$3.00
$\frac{3}{4}$ inch.....	3.00	$\frac{1}{4}$ inch.....	3.00
$\frac{1}{2}$ inch.....	3.00	$\frac{1}{8}$ inch.....	2.50

Size Block  $3 \times 3 \times \frac{3}{4}$  in.

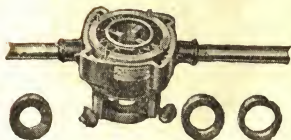
$1\frac{1}{2}$ inch.....	\$4.00	$\frac{3}{4}$ inch.....	4.00
$1\frac{1}{4}$ inch.....	4.00	$\frac{1}{2}$ inch.....	4.00
1 inch.....	4.00	$\frac{3}{8}$ inch.....	4.00

Size block  $4 \times 4 \times \frac{7}{8}$  for No. 2 Stock

2 inch.....	\$5.00	1 inch.....	\$5.00
$1\frac{1}{2}$ inch.....	5.00	$\frac{3}{4}$ inch.....	4.50
$1\frac{1}{4}$ inch.....	5.00	$\frac{1}{2}$ inch.....	4.50

# Pipe Tools

## "Toledo" Pipe Threading Devices



No. 10



No. 0

No. 00. A small, compact  $\frac{1}{8}$  to  $\frac{3}{4}$  inch ratchet threader. An ideal tool for the corner job. Separate die heads for each size. Packed in pasteboard carton.

No. 0. Easily operating  $\frac{1}{8}$  to  $\frac{3}{4}$  inch threader. One set of dies threads  $\frac{1}{8}$  inch, another set  $\frac{1}{4}$  and  $\frac{3}{8}$  inch, and a third set  $\frac{1}{2}$  and  $\frac{3}{4}$  inch pipe.

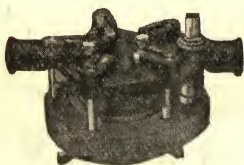
No. 1. A recognized "standard" among experienced pipe fitters for 1 to 2 inch pipe. A boy can thread 2 inch with it. No. 1-A is like No. 1 except has ratchet.

No. 10. Threads 1 to 2 inch pipe, with one set of dies. Left hand dies can be used, but it requires separate set of dies for each size. No. 10-A is like No. 10, except that it has ratchet.

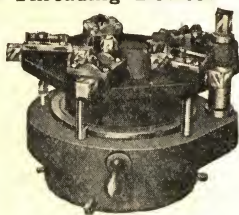
No.	Capacity	Net Wt.	List Price	Dies, Set 4 Segm'ts
00	$\frac{1}{8}$ to $\frac{3}{4}$ "	9 lbs.	\$19.00	\$2.00 each
0	$\frac{1}{8}$ to $\frac{3}{4}$ "	8 lbs.	16.00	2.50 each
1	1 to 2"	19 lbs.	24.00	2.50 each
1A	1 to 2"	22 lbs.	30.00	2.50 each
10	1 to 2"	19 lbs.	28.00	2.75 each
10A	1 to 2"	26 lbs.	34.00	2.75 each
1½R	2½ to 3"	37 lbs.	50.00	4.00 each

## Pipe Tools

### "Toledo" Geared Pipe Threading Devices



No. 2

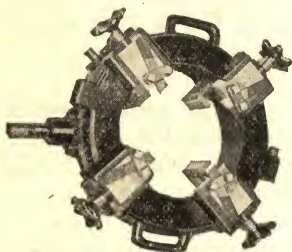


No. 25

No. 2 threads  $2\frac{1}{2}$  to 4 inch pipe so easily a boy can do it. Light, compact and rapid in operation. A most efficient tool. The No. 3 and No. 4 tools listed below are similar in design to the No. 2, but somewhat larger.

No. 25 threads  $2\frac{1}{2}$  to 6 inch pipe with one set of dies. An extra set furnished with each tool, and special long barrel bushings to facilitate securing perfectly straight threads.

No.	Capacity	Net Wt. Lbs.	List Price	Dies, Set 5 Segments
2	$2\frac{1}{2}$ to 4"	97	\$100.00	\$ 8.00 Each
25	$2\frac{1}{2}$ to 6"	200	230.00	8.00 Each
3	$4\frac{1}{2}$ to 8"	215	300.00	12.00 Each
4	9 to 12"	329	500.00	20.00 Each



### "TOLEDO" PIPE CUTTERS

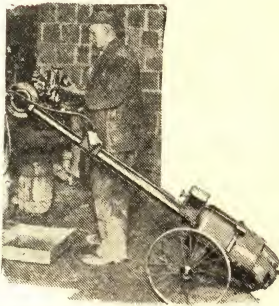
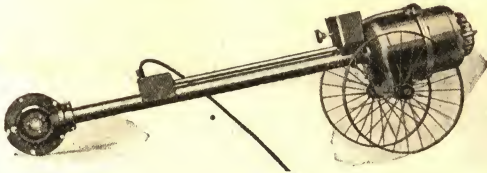
These pipe cutters actually cut off the pipe straight and true and without burr. They are portable, and may be split apart and slipped on pipe in a line or pipe with fittings on the ends. They are all geared tools except the "Vosper".

No.	Capacity	Net Wt. Lbs.	List Price	Cutter Blades	
Vosper	$\frac{1}{2}$ to 2"	11	\$ 16.00	\$1.00 each	\$2.00 set
250	$2\frac{1}{2}$ to 6"	98	80.00	.80 each	3.20 set
300	$4\frac{1}{2}$ to 8"	125	105.00	.80 each	3.20 set
350	7 to 10"	150	130.00	.80 each	3.20 set
400	9 to 12"	175	150.00	.80 each	3.20 set



# Pipe Tools

## "Toledo" Power Drive



The "Toledo" Power Drive is an electrically operated mechanism for driving hand operated pipe threading and cutting tools, and other devices now utilizing the hand cranking method of operation. It can be easily wheeled about on its light, but strong wire wheels, and is remarkably efficient. The drive operating "Toledo" tools will cut

a 2 inch thread in 20 seconds, a 4 inch thread in 2 minutes, a 6 inch thread in 3 minutes and an 8 inch thread in 3½ minutes.

Specially designed motors are furnished. It has two speed transmission gearing, controlled by shifting lever. No change is required in threading or cutting tool.

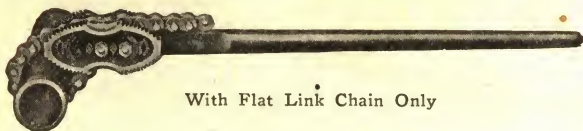
The drive is simple, solid and substantial and a marvel of efficiency. It will pay for itself in a short time.

Power Drive	List Price	Shipping Weight	Net Weight
With A.C. Motor, 60 Cycle, S.P.	\$600.00	325 lbs.	230 lbs.
With A.C. Motor, 50 Cycle, S.P.	600.00	325 lbs.	230 lbs.
With A.C. Motor, 40 Cycle, S.P.	700.00	350 lbs.	255 lbs.
With A.C. Motor, 30 Cycle, S.P.	700.00	350 lbs.	255 lbs.
With A.C. Motor, 25 Cycle, S.P.	700.00	350 lbs.	255 lbs.
With D.C. Motor.....	600.00	350 lbs.	255 lbs.
Spec. Attachm't for No. 1 Tool..	5.00	6 lbs.	5 lbs.

# Pipe Tools

## Vulcan Pipe Wrench

For Pipe, Pipe Fittings, etc.,  $\frac{1}{8}$  to 18 in. Diameter



With Flat Link Chain Only

Improved "Vulcan" Wrenches are wholly made from wrought steel. They are fully guaranteed.

The Double-Ended Reversible Jaws may be quickly changed end for end should teeth first in use show signs of wear, assuring the service of "two tools at the price of one."

The Fastening of Jaws to Handle with two tough studs of special steel makes repairs possible in emergencies and insure uninterrupted service; one stud will withstand full working strains when necessary.

The "straight-cut" teeth provide thorough distribution of gripping pressure; the tearing of pipe and one-spot wear of teeth is, therefore, wholly prevented.

The Chains swing from the center and can be used on either side of the jaws, thus reducing to the minimum the wear upon specific teeth. All parts are interchangeable. Swinging links are furnished with extra chains.

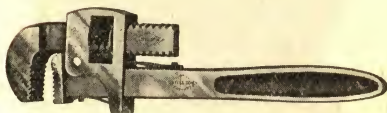
Number	30	31	32	33	33½	34	35	*16
*Capacity, Size Pipe, in.	$\frac{1}{8}$ -¾	$\frac{1}{8}$ -1½	$\frac{1}{4}$ -2½	$\frac{3}{4}$ -4	1-6	1½-8	2-12	4-18
Extreme Length	13¾	20	27	37	44½	50½	64½	87
Weight, lbs.	2¾	5¾	10	16	24	31	50	137
Flat Link Chain, lgth.	9½	13½	17½	22½	32	40½	55½	74½
Breaking strain, lbs.	3,600	6,700	9,800	12,500	14,300	15,700	21,800	40,000
Price, Compl. Wrench	\$2.50	\$3.50	\$5.00	\$7.00	\$9.00	\$11.00	\$18.00	\$40.00
Extra Chain	.75	1.00	1.50	2.50	3.50	4.50	7.50	20.00
Extra Jaws, pair	1.00	1.75	2.75	4.00	4.75	5.50	7.50	16.00
Extra Nuts and Studs for Jaws, per set	.20	.25	.35	.45	.55	.70	.90	

\*Wrenches for pipe sizes larger than 12 inches are supplied only in the non-reversible jaw form.



# Pipe Tools

## Genuine Stillson Wrench



### PLAIN OR WOOD HANDLE

Length, Open	Takes Pipe from, Ins.	Price Each	Jaws Each	Frames Each	Nuts Each
6 inches	$\frac{1}{8}$ to $\frac{1}{2}$	\$2.00	\$ .75	\$ .38	\$ .12
8 inches	$\frac{1}{8}$ to $\frac{3}{4}$	2.25	.80	.42	.15
10 inches	$\frac{1}{8}$ to 1	2.50	.85	.50	.20
14 inches	$\frac{1}{4}$ to $1\frac{1}{2}$	3.50	1.15	.60	.30
18 inches	$\frac{1}{4}$ to 2	5.00	1.75	.75	.35
24 inches	$\frac{1}{4}$ to $2\frac{1}{2}$	7.25	2.25	.95	.55
36 inches	$\frac{1}{2}$ to $3\frac{1}{2}$	13.50	4.35	1.70	1.10
48 inches	1 to 5	20.00	7.50	2.20	1.50

## Trimo Pipe Wrench



### PLAIN OR WOOD HANDLE

Length, Open	Takes Pipe from, Ins.	Price Each	Jaws Each	Frames Each	Nuts Each
6 inches	$\frac{1}{8}$ to $\frac{1}{2}$	\$2.00	\$ .75	\$ .38	\$ .12
8 inches	$\frac{1}{8}$ to $\frac{3}{4}$	2.25	.80	.42	.15
10 inches	$\frac{1}{8}$ to 1	2.50	.85	.50	.20
14 inches	$\frac{1}{4}$ to $1\frac{1}{2}$	3.50	1.15	.50	.30
18 inches	$\frac{1}{4}$ to 2	5.00	1.75	.75	.35
24 inches	$\frac{1}{4}$ to $2\frac{1}{2}$	7.25	2.25	.95	.55
36 inches	$\frac{1}{2}$ to $3\frac{1}{2}$	13.50	4.35	1.70	1.10
48 inches	1 to 5	20.00	7.50	2.20	1.50

## Steel Tool Chests



Style A One Till Chest

Made from  $\frac{1}{8}$  inch cold rolled sheet steel with malleable iron corner pieces and hardwood braces; fitted with heavy wrought iron hinges and hasp, with cover so arranged as to be held open by support from the back of chest. Each chest is furnished with a first-class brass lock with two keys, and bolts to screw down cover at front corners. They are lighter and cheaper than any first-class make of wood chest, and will outwear several wood chests. They are painted, well proportioned and ornamental in design, and make a first-class tool chest for Steam Fitters, Gas Fitters, Plumbers and other trades where a light and strong tool chest is required.

### STYLE A

					List	
					One Drawer	Two Drawers
No. 1.....	11 in.	12 in.	24 in.	60 lbs.	\$18.50	\$21.00
No. 2.....	14 in.	15 in.	30 in.	95 lbs.	25.00	27.00
No. 3.....	16 in.	17 in.	36 in.	125 lbs.	28.00	29.50
No. 4.....	19 in.	20 in.	42 in.	155 lbs.	32.00	33.00
No. 5.....	20 in.	22 in.	48 in.	185 lbs.	36.00	38.50

### STYLE B

					List	
					One Drawer	Two Drawers
No. 1.....	11 in.	12 in.	24 in.	65 lbs.	\$19.50	\$20.00
No. 2.....	14 in.	15 in.	30 in.	100 lbs.	27.00	28.00
No. 3.....	16 in.	17 in.	36 in.	135 lbs.	30.00	30.50
No. 4.....	19 in.	20 in.	42 in.	165 lbs.	33.50	35.00
No. 5.....	20 in.	22 in.	48 in.	200 lbs.	37.50	39.00

# Standard Full Weight Pipe

## Black and Galvanized

Size	List Price per Foot	Nominal Weight per Foot	Diameters		Pieces per Bundle	Average Feet per Bundle	Average Weight per Bundle	Threads per Inch	List Price per Thread for Cutting and Threading
			External	Internal					
1/2	\$ .05	.245	.405	.269	30	500	123	27	\$ .06
3/4	.06	.425	.540	.364	24	452	192	18	.06
1	.06	.568	.675	.493	18	345	196	18	.06
1 1/4	.08	.852	.840	.622	12	250	213	14	.06
1 1/2	.11	1.134	1.050	.824	7	142	161	14	.06
1 3/4	.17	1.684	1.315	1.049	5	105	177	11 3/4	.06
2	.23	2.281	1.660	1.380	3	62	141	11 3/4	.08
2 1/4	.27	2.731	1.900	1.610	3	62	169	11 3/4	.10
2 1/2	.37	3.678	2.375	2.067	..	..	..	11 3/4	.14
2 3/4	.58	5.819	2.875	2.469	..	..	..	8	.20
3	.76	7.616	3.500	3.068	..	..	..	8	.30
3 1/2	.92	9.202	4.000	3.548	..	..	..	8	.40
4	1.09	10.889	4.500	4.026	..	..	..	8	.40
4 1/2	1.27	12.642	5.000	4.506	..	..	..	8	.50
5	1.48	14.810	5.563	5.047	..	..	..	8	.60
6	1.92	19.185	6.625	6.065	..	..	..	8	.90
7	2.38	23.769	7.625	7.023	..	..	..	8	1.10
8	2.50	25.000	8.625	8.071	..	..	..	8	1.20
8	2.88	28.809	8.625	7.981	..	..	..	8	1.20
9	3.45	34.188	9.625	8.941	..	..	..	8	2.00
10	3.20	32.000	10.750	10.192	..	..	..	8	2.50
10	3.50	35.000	10.750	10.136	..	..	..	8	2.50
10	4.12	41.132	10.750	10.020	..	..	..	8	2.50
11	4.63	46.247	11.750	11.000	..	..	..	8	2.75
12	4.50	45.000	12.750	12.090	..	..	..	8	3.00
12	5.07	50.706	12.750	12.000	..	..	..	8	3.00

The permissible variation in weight is 5% over or under.

Weights and dimensions are nominal.

Furnished with threads and couplings and in random lengths unless otherwise ordered.

Random lengths are from 15 to 22 feet.

Cut length at special prices.

# Black Right Hand Nipples (Std)

Our nipples are made from new and selected pipe, the ends are reamed and chamfered, threads are true to gauge. These lengths are in accordance with the manufacturer's standard. Nipples longer than 12 inch will be made on order and charged as cut and threaded pipe, and nipples made to order from extra heavy pipe at double the above list price.

Length, Inches			Prices		Prices of Extra Long Nipples										
Close	Short	Long	Size, Ins.	Close or Long		Inches									
				Short	Long	4	5	6	7	8	9	10	11	12	
$\frac{3}{4}$	$1\frac{1}{2}$		$\frac{1}{8}$	\$ .04	\$ .06	\$ .07	\$ .08	\$ .10	\$ .12	\$ .14	\$ .15	\$ .17	\$ .18	\$ .19	
$\frac{7}{8}$	$1\frac{1}{2}$		$\frac{1}{4}$	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19	
1	$1\frac{1}{2}$	3	$\frac{3}{8}$	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19	
$1\frac{1}{8}$	$1\frac{1}{2}$	3	$\frac{1}{2}$	.05	.07	.08	.10	.12	.14	.16	.18	.20	.22	.23	
$1\frac{3}{8}$	2	3	$\frac{3}{4}$	.06	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	
$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	1	.08	.13	.15	.18	.21	.23	.25	.28	.31	.34	.36	
$1\frac{5}{8}$	3	4	$1\frac{1}{4}$	.11	.17	.20	.24	.29	.33	.36	.40	.44	.47	.49	
$1\frac{3}{4}$	$2\frac{1}{2}$	4	$1\frac{1}{2}$	.13	.20	.25	.29	.36	.40	.45	.50	.54	.57	.59	
2	$2\frac{1}{2}$	4	2	.18	.27	.32	.38	.45	.50	.54	.59	.65	.72	.77	
$2\frac{1}{2}$	3	$4\frac{1}{2}$	$2\frac{1}{2}$	.39	.59	...	...	.68	.90	.97	1.06	1.17	1.26	1.35	
$2\frac{3}{8}$	3	5	3	.48	.72	...	...	.85	1.08	1.20	1.33	1.45	1.58	1.70	
$2\frac{7}{8}$	4	$5\frac{1}{2}$	$3\frac{1}{2}$	.75	1.05	...	...	...	1.30	1.45	1.60	1.75	1.90	2.05	
$2\frac{7}{8}$	4	6	4	.85	1.20	...	...	...	1.52	1.69	1.87	2.05	2.22	2.40	
3	$4\frac{1}{2}$	$5\frac{1}{2}$	$4\frac{1}{2}$	1.25	1.70	...	...	...	2.25	2.50	2.75	2.95	3.17	3.40	
$3\frac{1}{8}$	$4\frac{1}{2}$	6	5	1.55	2.45	...	...	...	2.58	2.83	3.10	3.35	3.60	3.85	
$3\frac{1}{4}$	$4\frac{1}{2}$	6	6	1.85	2.90	...	...	...	3.05	3.35	3.70	4.00	4.30	4.65	
$3\frac{1}{2}$	5	$6\frac{1}{2}$	$6\frac{1}{2}$	3.20	...	...	...	3.60	4.05	4.45	4.90	5.30	5.75	6.15	
$3\frac{3}{4}$	5	7	7	3.55	...	...	...	4.05	4.55	5.05	5.50	6.00	6.50	7.00	
$3\frac{5}{8}$	...	...	8	5.25	...	...	...	...	...	...	...	...	...	...	
$3\frac{7}{8}$	...	...	9	6.75	...	...	...	...	...	...	...	...	...	...	
$4\frac{1}{2}$	...	...	10	8.00	...	...	...	...	...	...	...	...	...	...	
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## Black Right and Left Nipples (Standard)

Our nipples are made from new and selected pipe. The ends are reamed and chamfered. The threads are true to gauge. These lengths are in accordance with the manufacturer's standard. Nipples longer than 12 inches will be made on order and charged as cut and threaded pipe. Nipples made to order from extra heavy pipe at double the above cost.

Length, Inches			Prices		Prices of Extra Long Nipples												
Close	Short	Long	Size, Ins.	Close or Long		Inches											
				Short	Long	4	5	6	7	8	9	10	11	12			
$\frac{3}{4}$	$1\frac{1}{2}$	2	$\frac{1}{8}$	\$ .05	\$ .08	\$ .09	\$ .11	\$ .13	\$ .16	\$ .18	\$ .20	\$ .23	\$ .25	\$ .27			
$\frac{7}{8}$	$1\frac{1}{2}$	2	$\frac{1}{4}$	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27			
1	$1\frac{1}{2}$	2	$\frac{3}{8}$	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27			
$1\frac{1}{8}$	$1\frac{1}{2}$	2	$\frac{1}{2}$	.07	.10	.11	.13	.16	.18	.21	.24	.27	.29	.31			
$1\frac{1}{4}$	2	$2\frac{1}{2}$	$\frac{3}{4}$	.08	.12	...	.15	.17	.23	.25	.27	.29	.32	.35			
$1\frac{1}{2}$	2	$2\frac{1}{2}$	1	.11	.18	...	.20	.24	.31	.33	.37	.41	.45	.48			
$1\frac{5}{8}$	2	$2\frac{1}{2}$	$1\frac{1}{4}$	.15	.23	...	.27	.32	.39	.45	.50	.55	.60	.65			
$1\frac{3}{4}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{2}$	.18	.27	...	.34	.39	.48	.52	.60	.67	.72	.80			
2	$2\frac{1}{2}$	$3\frac{1}{2}$	2	.24	.36	...	.43	.51	.67	.72	.80	.87	.96	1.03			
$2\frac{1}{2}$	3	$4\frac{1}{2}$	$2\frac{1}{2}$	.52	.79	...	...	.91	1.20	1.30	1.40	1.55	1.68	1.80			
$2\frac{3}{8}$	3	$4\frac{1}{2}$	3	.65	.96	...	...	1.13	1.44	1.60	1.77	1.93	2.10	2.27			
$2\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$3\frac{1}{2}$	1.00	1.40	...	...	...	1.75	1.95	2.15	2.35	2.55	2.75			
$2\frac{7}{8}$	4	$5\frac{1}{2}$	4	1.15	1.60	...	...	...	2.00	2.25	2.50	2.75	3.00	3.25			



# Cast Iron Fittings (Std and Screwed)

STEAM PRESSURE 125 POUNDS

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12
Bushings, Hex.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bushings, Flush*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bushings, Eccentric	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cap†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Couplings, R. H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Couplings, R. & L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Couplings, Red.†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Crosses	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Crosses, Red.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbows, R. H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbows, R. & L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbows, Red.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbows, S. O.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbows, 45°	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbows, Dble. Br.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Flange Unions	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Floor Flanges	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Locknuts†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Plugs, Sq. Hd.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Plugs, Countersunk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Return Bends, C.P.R. H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Return Bends, C.P.R. & L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Return Bends, O.P.R. H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Return Bends, O.P.R. & L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tees, R. H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tees, Red.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tees, S. O.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Y's	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Y's, Red.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

\* Flush bushings are malleable.

† Sizes 1/8-2 are malleable; 2 and over cast iron.



## Black Malleable Unions, Common

Size, Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, each.....	\$ .18	\$ .18	\$ .20	\$ .22	\$ .27	\$ .33	\$ .46	\$ .58	\$ .75	\$1.55	\$2.10	\$3.65	\$4.35

## Black Ground Joint Unions

Size, Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Dart, each.....	\$ .30	\$ .30	\$ .40	\$ .50	\$ .60	\$ .80	\$1.20	\$1.60	\$2.00	\$3.20	\$4.80	\$7.20	\$10.80
Excel, each.....	.30	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80	....	....
Kewanee, each.....	.18	.19	.22	.27	.40	.48	.66	.80	1.14	2.10	2.65	....	....
Rhode Island, each.....	.30	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80	8.00	10.00
Star, each.....	...	.30	.40	.50	.60	.80	1.20	1.60	2.00	3.20	4.80	....	....

# Standard Cast Iron Flanged Fittings

LIST PRICES, EACH

Size, Inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14
Elbows Faced Only.....	3.00	3.00	3.00	3.15	3.45	4.05	4.50	5.50	6.25	7.60	10.50	12.00	17.00	19.00	28.00	41.50
Elbows Faced and Drilled.....	3.60	3.60	3.60	3.75	4.15	4.90	5.50	6.50	7.25	8.90	12.00	13.60	19.25	21.70	31.00	45.25
45° Elbows Faced Only.....	3.30	3.30	3.30	3.50	3.80	4.50	5.00	6.00	6.90	8.35	11.00	12.60	17.75	20.00	29.50	41.50
45° Elbows Faced and Drilled.....	3.90	3.90	3.90	4.10	4.50	5.35	6.00	7.00	7.90	9.65	12.50	14.20	20.00	22.70	32.50	45.25
Reducing Ells Faced Only.....	...	...	...	...	6.90	8.10	9.00	11.00	12.50	15.25	21.00	24.00	34.00	38.00	56.00	70.00
Reducing Ells Faced and Drilled...	...	...	...	...	7.60	8.95	10.00	12.00	13.50	16.55	22.50	25.60	36.25	40.70	59.00	73.75
Tees Faced Only.....	4.35	4.35	4.35	4.55	5.00	5.85	6.50	8.00	9.10	11.00	15.25	17.40	24.65	27.50	40.50	60.00
Tees Faced and Drilled.....	5.25	5.25	5.25	5.45	6.10	7.10	8.00	9.50	10.60	12.95	17.50	19.80	28.00	31.50	45.00	65.50
Reducing Tees Faced Only.....	...	5.00	5.00	5.25	5.75	6.75	7.50	9.25	10.50	12.65	17.50	20.00	28.50	31.50	46.50	69.00
Reducing Tees, Faced and Drilled...	...	5.90	5.90	6.15	6.85	8.00	9.00	10.75	12.00	14.60	19.75	22.40	31.85	35.50	51.00	74.50
Single Sweep Tees Faced Only.....	...	...	5.00	5.25	5.75	6.75	7.50	9.25	10.50	12.65	17.50	20.00	28.50	31.50	46.50	69.00
Single Sweep Tees Faced & Drilled	...	...	5.90	6.15	6.85	8.00	9.00	10.75	12.00	14.60	19.75	22.40	31.85	35.50	51.00	74.50
Double Sweep Tees Faced Only.....	...	...	5.00	5.25	5.75	6.75	7.50	9.25	10.50	12.65	17.50	20.00	28.50	31.50	46.50	69.00
Double Sweep Tees Faced & Drilled	...	...	5.90	6.15	6.85	8.00	9.00	10.75	12.00	14.60	19.75	22.40	31.85	35.50	51.00	74.50
Single Sweep Reducing Tees Faced Only	...	...	5.75	6.00	6.60	7.75	8.65	10.60	12.00	14.50	20.00	23.00	32.75	36.00	53.50	79.00
Single Sweep Reducing Tees Faced and Drilled.....	...	...	6.65	6.90	7.70	9.00	10.15	12.10	13.50	16.45	22.25	25.40	36.10	40.00	58.00	84.50
Double Sweep Reducing Tees Faced Only	...	...	5.75	6.00	6.60	7.75	8.65	10.60	12.00	14.50	20.00	23.00	32.75	36.00	53.50	79.00
Double Sweep Reducing Tees Faced and Drilled.....	...	...	6.65	6.90	7.70	9.00	10.15	12.10	13.50	16.45	22.25	25.40	36.10	40.00	58.00	84.50

# Standard Cast Iron Flanged Fittings

LIST PRICES, EACH

Size, Inches	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14
Crosses Faced Only.....	6.75	6.75	6.75	6.95	7.65	9.00	10.00	12.00	13.75	16.75	23.00	26.50	37.50	42.00	61.50	91.00
Crosses Faced and Drilled.....	7.95	7.95	7.95	8.15	9.05	10.70	12.00	14.00	15.75	19.25	26.00	29.75	42.00	47.50	67.50	98.50
Red'g Crosses Faced Only.....	...	...	7.75	8.00	8.75	10.35	11.50	13.75	15.75	19.25	26.50	30.50	43.00	48.00	71.00	105.00
Red'g Crosses Faced and Drilled	...	...	8.95	9.20	10.15	12.05	13.50	15.75	17.75	21.75	29.50	33.75	47.50	53.50	77.00	112.50
Long Radius Ells Faced Only..	...	...	5.05	5.25	5.75	6.75	7.50	9.25	10.50	12.65	17.50	20.00	28.50	31.50	46.50	69.00
Long Rad. Ells Faced & Drilled	...	...	5.90	6.15	6.85	8.00	9.00	10.75	12.00	14.60	19.75	22.40	31.85	35.50	51.00	74.50
Base Ells Faced Only.....	...	...	...	...	...	...	9.00	11.00	12.50	15.25	21.00	24.00	34.00	38.00	56.00	70.00
Base Ells Faced and Drilled....	...	...	...	...	...	...	10.00	12.00	13.50	16.55	22.50	25.60	36.25	40.70	59.00	73.75
Facing and Drilling Base Flanges	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
of Base Elbows.....	...	...	...	...	...	...	3.00	3.00	3.50	3.50	3.50	5.00	5.00	5.00	7.50	7.50
Reducers Faced Only.....	...	...	...	...	6.90	8.10	9.00	11.00	12.50	15.25	21.00	24.00	34.00	38.00	56.00	70.00
Reducers Faced and Drilled....	...	...	...	...	7.60	8.95	10.00	12.00	13.50	16.55	22.50	25.60	36.25	40.70	59.00	73.75

# Standard Cast Iron Flanges

LIST PRICES, EACH

Size, Inches	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14
Standard Flanges Faced Only.....	.55	.60	.65	.75	.85	.95	1.20	1.35	1.45	1.60	2.00	2.65	3.10	3.85	4.50	6.50	9.00
Standard Flanges Faced and Drilled...	.80	.85	.90	1.00	1.10	1.25	1.55	1.80	1.90	2.05	2.50	3.25	3.80	4.65	5.50	7.65	10.35
Outside Diameter of Reducing and	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blind Flanges, Inches.....	...	...	...	6	7	7½	8½	9	9¼	10	11	12½	13½	15	16	19	21
Std. Red'g Flanges Faced Only.....	...	...	...	1.30	1.45	1.55	2.00	2.20	2.40	2.65	3.30	4.40	5.10	6.35	7.45	10.75	15.00
Std. Red'g Flanges Faced and Drilled..	...	...	...	1.55	1.70	1.85	2.35	2.65	2.85	3.10	3.80	5.00	5.80	7.15	8.45	11.90	16.35
Std. Blind Flanges Faced Only.....	...	...	...	1.15	1.30	1.40	1.80	2.00	2.20	2.40	3.00	4.00	4.60	5.75	6.75	9.75	13.50
Std. Blind Flanges Faced and Drilled...	...	...	...	1.40	1.55	1.70	2.15	2.45	2.65	2.85	3.50	4.60	5.30	6.55	7.75	10.90	14.85

All reducing flanges of same outside diameter take same prices.

# Branch Tees

## LIST PRICES

No. of Branches	1 INCH BRANCH TEES			1 1/4 INCH BRANCH TEES			1 1/2 INCH BRANCH TEES			2 INCH BRANCH TEES		
	2 1/2 inches Center to Center			3 inches Center to Center			3 1/2 inches Center to Center			4 1/2 inches Center to Center		
	1 in. or 1 1/4 in. Run	1 1/2 in. Run	2 in. Run	1 1/4 in. or 1 1/2 in. Run	2 in. Run	2 1/2 in. Run	1 1/2 in. or 2 in. Run	2 1/2 in. Run	3 1/2 in. Run	2 in. Run	2 1/2 in. or 3 in. Run	3 1/2 in. Run
2	.90	1.00	1.15	5.25	6.50	7.65	8.50	10.50	11.50	15.00	16.50	20.00
3	1.05	1.15	1.35	1.30	1.50	1.95	2.10	2.85	3.15	4.10	4.50	5.00
4	1.15	1.30	1.60	1.65	1.90	2.40	2.70	3.45	3.80	5.25	5.75	6.25
5	1.35	1.45	1.85	2.00	2.40	2.85	3.35	4.15	4.60	7.00	7.50	8.00
6	1.60	1.75	2.10	2.40	2.90	3.55	4.00	5.00	5.50	7.65	8.50	9.25
7	1.90	2.20	2.45	2.80	3.30	3.95	4.65	5.75	6.25	8.80	9.75	10.75
8	2.20	2.45	2.75	3.20	3.90	4.20	5.25	6.50	7.25	10.60	11.75	13.00
9	2.65	2.90	3.40	3.60	4.50	4.95	5.85	7.00	7.75	11.50	12.75	14.00
10	3.15	3.30	4.00	4.30	5.25	6.15	6.50	8.25	9.00	12.25	13.50	15.00
11	3.75	4.50	4.80	4.80	5.85	6.85	7.60	9.25	10.00	13.50	15.00	16.50
12	4.40	4.75	5.10	5.00	6.25	7.25	8.00	9.75	10.75	14.25	15.75	18.00

All openings in branch tees for circulation are tapped right hand.

Branch tees for box coils are always tapped left hand in branches and right hand in back inlet.

1-inch branch tees, 1-inch or 1 1/4-inch run, are 1 3/4 inches inside diameter.

1-inch branch tees, 1 1/2-inch or 2-inch run, are 2 1/4 inches inside diameter.

1 1/4-inch branch tees are all 2 1/2 inches inside diameter.

1 1/2-inch branch tees are all 2 3/4 inches inside diameter.

2-inch branch tees are all 3 1/2 inches inside diameter.

1-inch branch tees, 1-inch and 1 1/4-inch run, are also made 2 1/4-inch inside diameter at an advanced price.

The run and the back opening of branch tees are tapped the same size as branches, unless otherwise ordered.

# Brass and Iron Valves, Cocks, Etc.

## LIST PRICES

Size, inches.....	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Globe and Angle Valves, Brass, each .....	.72	.72	.77	1.00	1.26	1.80	2.52	3.50	5.30	10.00	14.40	26.50	36.00	....	....	...
Globe and Angle Valves, Jenkins Disc, each.....	..	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00	....	....	....	....	...
Check Valves, Brass, Horiz., ea. ....	.65	.65	.70	.90	1.15	1.60	2.25	3.15	4.75	9.00	13.00	24.00	32.50	....	....	...
Check Valves, Swing, Brass, ea. ....	..	1.80	1.80	2.00	2.25	2.80	3.65	4.75	6.75	15.00	24.00	....	....	....	....	...
Safety Valves, Brass, each.....	..	2.20	2.50	3.25	3.90	4.70	7.15	9.00	12.50	22.50	33.50	....	....	....	....	...
Gate Valves, Brass, each.....	..	1.45	1.45	1.65	2.05	2.80	3.70	5.00	7.30	13.00	19.00	....	....	....	....	...
Steam Cocks, Brass, each.....	.85	.85	1.00	1.25	1.70	2.35	3.70	4.85	7.30	14.50	22.50	38.50	50.00	....	....	...
Gas Service Cocks, Brass, each.....	.90	.90	1.00	1.10	1.30	2.10	3.25	4.60	8.00	17.50	27.00	....	....	....	....	...
Globe and Angle Valves, Iron, Screwed, each.....	..	....	....	....	....	2.25	2.75	3.50	5.40	7.35	9.80	....	....	....	....	...
Globe and Angle Valves, Iron, Yoke, Screwed, each.....	..	....	....	....	....	....	....	....	7.00	9.00	12.50	15.25	19.00	24.00	27.00	37.50
Check Valves, Iron, Screwed. Horizontal, each.....	..	....	....	....	....	1.50	2.20	2.65	3.60	6.50	8.90	12.25	14.25	19.00	22.00	30.00
Check Valves, Iron, Flanged, Horizontal, each.....	..	....	....	....	....	....	....	....	5.25	8.25	11.50	15.50	18.00	22.50	26.00	35.00
Safety Valves, Iron, Screwed, ea. ....	..	....	....	....	3.50	4.00	5.00	5.80	7.80	13.25	17.25	23.00	28.75	34.50	41.50	57.75
Safety Valves, Iron, Flanged, ea. ....	..	....	....	....	....	5.50	6.75	7.75	10.25	16.00	21.50	27.50	34.00	40.00	48.00	65.00
Gate Valves, Iron, Screwed.....	..	....	....	....	....	....	....	..	10.00	11.50	14.00	17.00	19.00	24.00	27.50	32.50
All Iron Cocks, each.....	..	....	.85	.90	1.05	1.30	1.60	1.95	2.70	4.40	6.75	12.00	15.50	....	32.00	45.00
Iron Cocks, Brass Plug, each....	..	....	1.25	1.30	1.60	1.90	2.65	3.75	5.75	8.75	13.00	27.50	36.50	....	67.00	94.00



## Hook Plates

There is no necessity of carrying a large stock of Pierce Hook Plates, since they are made to break off so easily into desired multiples. By carrying a six branch hook plate in different sizes any number of branch hooks may be obtained. The centers will always come right.

Number of Hooks	1	2	3	4	5	6	7	8	9	10	11	12
For $\frac{3}{4}$ " Pipe, $2\frac{1}{2}$ " Centers	\$ .08	\$ .16	\$ .21	\$ .24	\$ .28	\$ .34	\$ .40	\$ .45	\$ .50	\$ .56	\$ .68	\$ .72
For 1" Pipe, $2\frac{1}{2}$ " Centers	.09	.18	.23	.26	.32	.33	.48	.59	.65	.70	.85	1.00
For $1\frac{1}{4}$ " Pipe, 3" Centers	.10	.21	.27	.32	.41	.52	.68	.80	.90	1.20	1.35	1.40
For $1\frac{1}{2}$ " Pipe, $3\frac{1}{2}$ " Centers	.15	.28	.43	.58	.72	.88	1.10	1.25	1.40	1.55	1.65	1.90
For 2" Pipe, $4\frac{1}{2}$ " Centers	.22	.43	.65	.90	1.15	1.35	1.75	2.00	2.25	2.50	2.75	3.00



## A. S. M. E. Boiler Code

Standard specifications for the construction and care of steam boilers have been formulated by the American Society of Mechanical Engineers. This code has already become a part of the law of many states and its application will undoubtedly be extended. Part 1, Section 2 of this code deals with boilers used exclusively for low pressure steam and hot water heating and hot water supply. It covers both cast iron and steel plate boilers used for heating purposes.

All Pierce boilers are built in strict accordance with these specifications in every particular.

# Measuring Radiation Requirements

## Method Number 1

In this method the heat losses from a room are first determined. These losses are measured in British thermal units (B. T. U.). A British thermal unit is the amount of heat necessary to raise one pound of water one degree in temperature Fahrenheit. First the following information must be secured:

(1) Find the number of cubic feet in contents of room to be heated.

(2) Find the square feet of glass surface.

(3) Find the square feet of wall surface exposed to the air, from which subtract the square feet of glass as determined above. Inside walls are neglected when adjoining rooms are heated.

(4) Determine the temperature desired for the room. Good practice usually places this at 68° or 70°. Next determine the minimum outside temperature. This is usually assumed to be zero. Subtract the degree of outside temperature from degree of temperature required in room, giving total rise in temperature required.

Then proceed as follows:

Multiply the cubic feet of contents by the temperature rise desired. Divide the quantity so obtained by 56 (which is the number of cubic feet of air one B. T. U. will raise one degree per hour.) This gives the number of B. T. U.s required to raise the air in the room to the desired degree of temperature.

Multiply the square feet of exposed glass surface by the temperature rise desired, and multiply this result by 1.25 (which is the B. T. U. loss through one square foot of glass of single thickness per hour per degree difference in temperature. See table on page 194.

## Measuring Radiation Requirements

Multiply the net square feet of wall surface as found above by the temperature rise desired, and multiply this result by the factor shown on page 194, which corresponds to the construction of the wall in question. (This gives the B. T. U. loss through this type of wall per hour.)

For an approximately accurate result, add the results of the above and divide by 250 if for steam radiation, as there is an average of 250 B. T. U. given off from cast iron steam radiation per square foot of surface per hour. If for hot water radiation, divide the sum of the results by 169.

If a greater measure of accuracy is desired, substitute one of the figures given in the tables on page 196, depending on the type of radiation used.

### EXAMPLE

Given a room 12'x16' with 9' ceiling and 12" brick wall exposed to the air on two sides; with three windows each 3'x6'. Outside temperature zero, temperature desired for room 70°.

To determine amount of steam radiation required.

Room 12'x16'x9'.....1728 cu. ft.  
Three windows 3'x6'..... 54 sq. ft.  
Wall:  $16 + 12 \times 9 = 252 - 54$  ..... 198 sq. ft.  
 $1728 \times 70 \div 56 = 2160$  B T U to heat air.  
 $54 \times 70 \times 1.25 = 4725$  B T U loss through glass.  
 $198 \times 70 \times .30 = 4158$  B T U loss through wall.

11043 Total B T U loss.

$11043 \div 250 = 44$  sq. ft.—Amount of Cast Iron Steam Radiation required.

### Method Number 2

This is known as the Mills or the "2-20-200" Formula. Allow one square foot of radiating surface for each two square feet of glass surface, one for each twenty square feet of outside walls, and one for each two hundred cubic feet of room contents.

# Measuring Radiation Requirements

## Heat Transmission Through Windows, Walls, Roofs, Ceilings, etc.

The right hand column in the following table gives the number of B. T. U. transmitted per square foot, per hour, per degree difference in temperature between inside and outside air.

### Solid Brick Wall

4 inches thick.....	.60
8 inches thick.....	.42
12 inches thick.....	.30
16 inches thick.....	.24
20 inches thick.....	.21
24 inches thick.....	.19

### Concrete Wall

8 inches thick.....	.48
12 inches thick.....	.45
16 inches thick.....	.39
20 inches thick.....	.38
24 inches thick.....	.31

### Frame Wall

Ordinary overlapping clapboards, $\frac{7}{8}$ -inch.....	.48
Same with paper lining.....	.34
Same with $\frac{3}{4}$ -inch sheathing.....	.30
Same with $\frac{3}{4}$ -inch sheathing and paper.....	.25

### Glass

Single window.....	1.25
Double window.....	.62
Single skylight.....	1.50
Double skylight.....	.75
In Monitor, single.....	1.35

Doors are considered same as windows.

### Ceilings

Lath and plaster (no floor above).....	.40
Lath and plaster (wood floor above).....	.36

### Roofs

Patent Roofing—paper, tar and gravel.....	.30
Hollow Tile with 2 inches cement, tar and gravel covering	.60
Asphalt .....	.27
Slate Roof with sheathing.....	.40

### Floors

Double Wood Flooring, no plaster beneath.....	.24
Concrete on ground.....	.40
Wood near ground.....	.20



# Measuring Radiation Requirements

## Locating Radiators

Direct radiation should usually be set along the exposed cold walls and if possible under the windows. If placed along the inside walls of the room the tendency is to cause drafts of cold air across the floor.

For the halls it is good practice to place sufficient radiation in first or lower hall to heat those of all floors providing they are in a reasonable direct line, one above the other. If the hall on top floor has a skylight over it, it is advisable to place a separate radiator on the top floor, as nearly under the skylight as possible, to off-set the circulation of chilled air caused by the exposed glass.

Indirect registers give best results if located on the inside walls of the room because the warm air immediately rises to the ceiling on entering the room and then descends with the cooler air around the outside walls.

It is possible to obtain a much better circulation of air from indirect radiators when the discharge is from inside partitions. For this reason the ducts should not be run in cold outside walls and the registers should not be placed directly under windows if it can be avoided.

## Allowance in Radiator Size for Unusual Conditions

If radiators are placed under flat shelf add about 10% to overcome impeded circulation. If placed in open recess add about 15%. If covered entirely with grille add about 25%. If placed under window seat with grille in the front at top and bottom, add about 30% and make grille size at top allowing about 3 square inches of net area per foot of radiation with bottom grille allowance of about 2 square inches per square foot of radiation.

One square foot of direct radiation standing in still air at temperature of 70 degrees will condense about .25 pounds of steam per hour.

The condensation of one square foot of indirect radiation, when the air is admitted at zero temperature and is of usual volume for residence work, will be about three-fifths greater than in direct radiation as given above and the condensation in one square foot of pipe coil against wall will be about one-fourth greater than in direct radiation above.

## Measuring Radiation Requirements

In localities where the temperature falls below zero, add to the amount of radiation obtained 1 *per cent for every degree below zero.*

### Heat Transmission Through Direct Radiators

#### STEAM

The transmission of heat through radiators varies with the type and height of radiator used, also with the difference in temperatures between that of the steam in the radiator and of the room in which the radiator is placed.

The following table gives approximately the number of B. T. U.'s transmitted per square foot of heating surface per hour for the usual types and heights of radiators with steam at 3 lbs.—temperature about 220°—and room temperature of 70°.

TYPE	22" High	26" High	32" High	38" High
1 Col.....	285	279	275	270
2 Col.....	270	263	257	250
3 Col.....	255	248	240	231
4 Col.....	240	233	255	218
Window .....	...	...	277	...
Wall (horizontal).....	...	...	293	...
Wall (vertical).....	...	...	285	...
Pipe Coils.....	...	...	300	...

The above amounts are based on a difference of 150 degrees between the temperatures of steam in the radiator and of the room in which the radiator stands.

#### HOT WATER

The transmission of heat through hot water radiators is subject to the same general conditions as above except in the temperatures used. The maximum temperature of hot water is usually estimated at 180°; the room temperature at 70° gives a difference between the heating medium and surrounding air of 110°. The following table gives approximately the number of B. T. U. transmitted under these conditions per hour per square foot of radiation.

TYPE	22" High	26" High	32" High	38" High
1 Col.....	193	188	185	183
2 Col...	183	177	173	169
3 Col.....	172	167	162	156
4 Col.....	162	157	152	146
Window .....	...	187	...	...
Wall (horizontal).....	...	197	...	...
Wall (Vertical).....	...	193	...	...
Pipe Coil.....	...	202	...	...



# Heating Surface in Standard Pipe

Length of Pipe in ft.	SIZE OF PIPE									
	¾	1	1¼	1½	2	2½	3	4	5	6
1	.275	.346	.434	.494	.622	.753	.916	1.175	1.455	1.739
2	.5	.7	.9	1.	1.2	1.5	1.8	2.4	2.9	3.5
3	.8	1.	1.3	1.5	1.9	2.3	2.7	3.5	4.4	5.2
4	1.1	1.4	1.7	2.	2.5	3.	3.6	4.7	5.8	7.
5	1.4	1.7	2.2	2.4	3.1	3.8	4.6	5.8	7.3	7.7
6	1.6	2.1	2.6	2.9	3.7	4.5	5.5	7.	8.7	10.5
7	1.9	2.4	3.	3.4	4.4	5.3	6.4	8.2	10.2	12.1
8	2.2	2.8	3.5	3.9	5.	6.	7.3	9.4	11.6	13.9
9	2.5	3.1	3.9	4.4	5.6	6.8	8.2	10.6	13.1	15.7
10	2.7	3.5	4.3	4.9	6.2	7.5	9.1	11.8	14.6	17.4
11	3.	3.8	4.8	5.4	6.8	8.3	10.	12.9	16.	19.1
12	3.3	4.1	5.2	5.9	7.5	9.	11.	14.1	17.4	20.9
13	3.6	4.5	5.6	6.4	8.1	9.8	11.9	15.3	18.9	22.6
14	3.8	4.8	6.1	6.9	8.7	10.5	12.8	16.5	20.3	24.3
15	4.1	5.2	6.5	7.4	9.3	11.3	13.7	17.6	21.8	26.1
16	4.4	5.5	6.9	7.9	10.	12.	14.6	18.8	23.2	27.8
17	4.7	5.9	7.4	8.4	10.6	12.8	15.5	20.	24.7	29.5
18	5.	6.2	7.8	8.9	11.2	13.5	16.5	21.2	26.2	31.3
19	5.2	6.6	8.3	9.4	11.8	14.3	17.4	22.3	27.6	33.1
20	5.5	6.9	8.7	9.9	12.5	15.	18.3	23.5	29.1	34.8
25	6.9	8.6	10.9	12.3	15.6	18.8	22.9	29.3	36.3	43.5
30	8.3	10.4	13.	14.8	18.7	22.5	27.5	35.3	43.6	52.1
35	9.6	12.1	15.2	17.3	21.8	26.3	32.	41.1	50.9	60.8
40	11.	13.8	17.4	18.8	24.9	30.1	36.6	47.	58.2	69.5
45	12.4	15.6	19.5	22.2	28.	33.8	41.2	52.9	65.5	78.2
50	13.8	17.3	21.7	24.7	31.1	37.6	45.8	58.7	72.7	87.
55	15.2	19.0	23.9	27.1	34.3	41.3	50.4	64.6	80.1	95.6
60	16.6	20.8	26.0	29.6	37.3	45.2	55.	70.5	87.3	104.3
65	18.0	22.6	28.2	32.1	40.5	48.8	59.5	76.4	94.5	112.9
70	19.4	24.2	30.4	34.6	43.5	52.7	64.1	82.3	101.9	121.7
75	20.7	26.0	32.6	37.1	46.6	56.5	68.7	88.1	109.1	130.4
80	22.	27.7	34.7	39.6	49.8	60.2	73.3	94.0	116.4	139.1
85	23.4	29.4	36.9	42.0	53.4	63.9	77.8	99.9	123.7	147.9
90	24.8	31.1	39.1	44.5	56.	67.8	82.4	105.8	130.9	156.5
95	26.2	32.9	41.2	46.9	59.6	71.5	87.2	111.6	138.2	165.2
100	27.5	34.6	43.4	49.4	62.2	75.3	91.6	117.5	145.5	173.9

The above table will be found very convenient in estimating the amount of radiating surface in mains, etc.

# Greenhouse Heating

Table of Amounts of Steam Radiating Surface Necessary to Heat a Given Amount of Glass Exposure to Various Temperatures in Zero Weather

Square Feet of Exposure	STEAM					Square Feet of Exposure	° HOT WATER				
	No. of Square Feet of Radiation Required at						No. of Square Feet of Radiation Required at				
	40°	45°	50°	60°	70°		40°	45°	50°	60°	70°
25	27-9	31-8	34-7	41-6	5	25	41-6	5	61-4	71-7	81-3
50	55-9	61-4	71-7	81-3	10	50	8	10	13	14	16
75	8	9	10	13	15	75	13	15	19	21	25
100	11	13	14	17	20	100	17	20	25	29	33
200	23	25	30	33	40	200	33	40	50	57	67
300	34	38	43	50	60	300	50	60	75	86	100
400	45	50	57	67	80	400	67	80	100	114	133
500	56	63	72	83	100	500	83	100	125	143	167
1000	112	125	143	167	200	1000	167	200	250	286	333
2000	223	250	286	333	400	2000	333	400	500	572	667
3000	334	375	429	500	600	3000	500	600	750	857	1000
4000	445	500	571	667	800	4000	667	800	1000	1143	1333
5000	556	625	714	833	1000	5000	833	1000	1250	1429	1667
10000	1112	1250	1429	1667	2000	10000	1667	2000	2500	2857	3333
20000	2223	2500	2857	3333	4000	20000	3333	4000	5000	5714	6667

For poorly constructed houses add 10 per cent to the above amounts.

# Piping Systems

## In General

Piping systems in general fall into two main classes: Gravity or Natural Circulation Systems and Mechanical or Induced Circulation Systems. Gravity systems use standard pipes and fittings, and no special devices of any type. Induced circulation systems depend on special devices for their operation.

A type of induced circulation recommended by the Pierce organization is described on later pages.

## Gravity Systems

### ONE PIPE STEAM SYSTEM

A one pipe system is one that provides only one pipe to a radiator. It is very generally used in low pressure house heating. It involves a very simple arrangement of piping and it costs less than a two pipe plant. Fewer pipes and fittings are required and the cost of labor for installation is less.

Two general methods of running pipe mains in the cellar are used. In one method the steam main rises directly above the boiler as high as possible, and then passes around the cellar, coming back to the return side of the boiler. This is known as the circuit method. The other method is known as the drip method. It involves a scheme of branch mains or feeders with drips at the end of each.

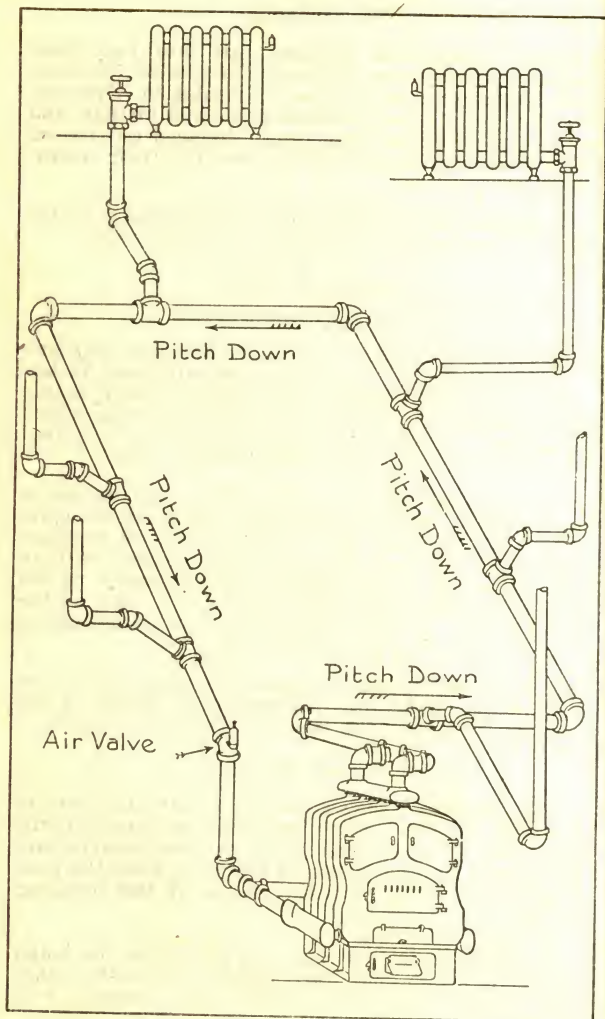
The circuit system is generally used and most generally satisfactory. However, the shape of the building influences the type of system to be used.

## Circuit System

The illustration shows the general arrangement of a circuit system. Sometimes two or more circuits are used, generally one circuit is more satisfactory and should be used wherever circumstances, the location of the boiler and the shape of the building, permit.

A circuit main has the same size from the boiler outlet to about four feet beyond the last branch connection. Here it is vented and connects with

## Piping Systems

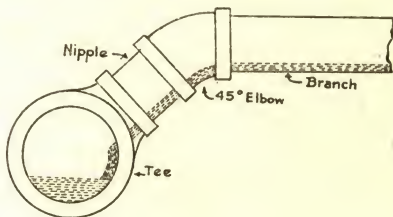


## Piping Systems

the return line, which takes the water of condensation back to the boiler. Up to this point the main is large enough to supply steam to all the radiators. The main is kept the same size throughout its length because the condensation from each branch pipe reduces the pipe area available for steam. Consequently, while there is less steam in the main near the end than near the beginning, there is more water of condensation.

A circuit main attains its maximum height directly above the boiler. From that point it pitches down 1 inch in every ten feet to the end. Condensation from the radiators flows into the main and along the bottom of the main to the return.

Branches from the main should be taken at an angle of 45 degrees. This will permit the water of condensation to return without interference from the steam, as the illustration shows.



These branches should be run to vertical risers or radiators at a uniform up-grade of one inch in ten feet.

It is necessary to continue a steam main beyond the last branch connection. Should this not be done and the main terminated in a tee, one branch of which went to the radiation and one branch to the return, the steam will force water into the branch and radiators. This extra space also allows for an accumulation for air before it passes through the air vent.



# Piping Systems

## Sizes of Steam Mains, Single Pipe

Direct Radiation; Pressure 0.5 Pounds

Radiating Surface Sq. Ft.	Length Steam Main in Feet								
	20	40	80	100	200	300	400	600	1000
	Sizes of Mains—Single Pipe								
20	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½
40	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½
60	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½
80	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1½	2
100	1¼	1½	1½	1½	1½	1½	1½	1½	2
200	1½	1½	2	2	2	2	2	2½	3
300	2	2	2	2	2	2½	2½	3	3½
400	2	2	2½	2½	2½	3	3	3	4
500	2	2½	2½	3	3	3	3½	3½	4
600	2½	2½	3	3	3	3½	3½	4	4½
800	2½	3	3½	3½	3½	3½	4	4	5
1,000	3	3½	3½	4	4	4	4	4½	6
1,400	3½	3½	4	4	4	4½	4½	5	6
1,800	4	4	4	4	4½	5	5	6	7
2,000	4	4	4	4½	4½	5	5	6	7
3,000	4½	4½	4½	5	5	6	6	7	8
4,000	5	5	5	6	6	7	7	7	9
6,000	5½	5½	6	7	7	7	7	8	10
8,000	5½	5½	6	7	7	8	8	9	11
10 000	6	6	6	7	8	8	9	10	12

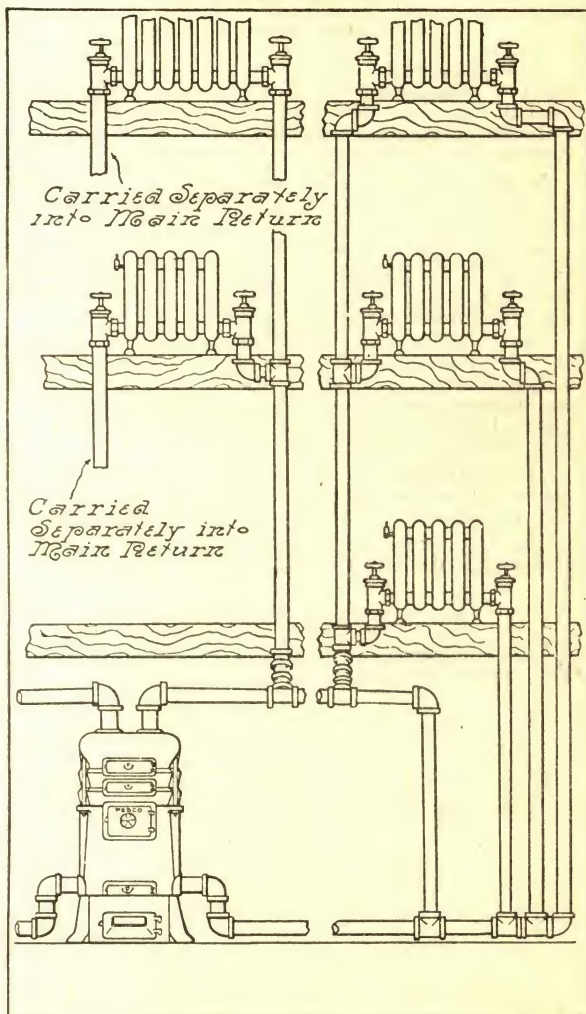
For obtaining the size of steam main to be used in case there is a separate return, multiply the above by 0.82.

For obtaining the size of Steam Main to be used in case Allowance must be made for pipes hung low, with slight grade, or for long or crooked runs.

The size of branch connections to the radiators is usually determined by the tapping of the radiator supplied.



# Piping Systems



# Piping Systems

## Two Pipe Steam System

This illustration shows the principal features of the two pipe system of steam heating. It involves, as will be seen, two pipes connecting with every radiator—one pipe supplies the steam; the other returns the condensation to the boiler.

In this system, too, the high point is directly over the boiler. From this point its mains and supply branches pitch downward 1 inch in 10 feet.

Smaller steam pipes are used with this system than with the one pipe system, as they need carry only dry steam and the condensation which takes place in the steam pipes themselves.

The trunk line is reduced as branches are taken off. A drip should be placed at the bottom of each supply riser to prevent water returning to the main and forming in pockets where reducing fittings are used. Drips will be required in the main trunk line only for runs of over 50 feet.

The return line should be "wet" (placed below the water line of the boiler). This seals each drip and return connection, thereby preventing short circuits.

The two pipe steam system is used mainly in larger installations and for indirect radiators.

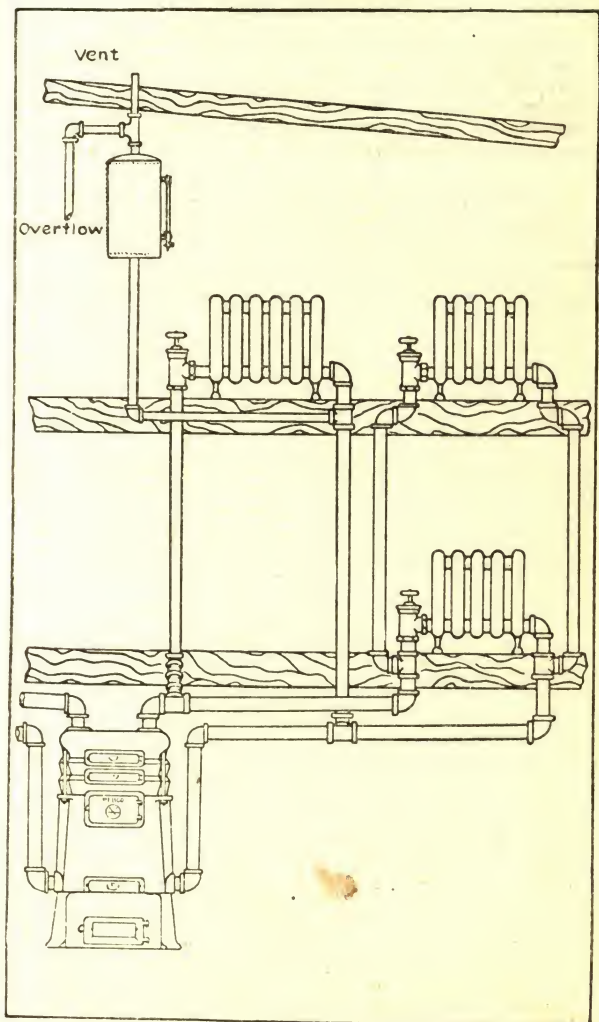
## Sizes of Mains, Two Pipe Steam

This table may be used for all ordinary conditions of domestic installations.

Main Assumed 100 Feet in Length

Size of Main Inches	Square Feet of Radiation	Diameter of Return		Diam. of Drip for Main Inches
		Dry Inches	Sealed Inches	
1¼	80	1	1	¾
1½	200	1¼	1	¾
2	400	1½	1¼	¾
2½	640	2	1½	¾
3	1,000	2	2	1
3½	1,500	2½	2	1
4	2,000	3	2½	1
4½	2,500	3	2½	1¼
5	3,600	3½	3	1¼
6	5,000	4	3½	1¼

## Piping Systems



# Piping Systems

## Hot Water Systems

Ordinarily two pipes are used, although there is a one pipe hot water system. The expansion tank may be open to the atmosphere, in which case the system is known as an open tank system, or the water may be under pressure, in which case the system is known as a closed tank system.

### The Two Pipe Hot Water Heating System

The system illustrated is known as the two pipe hot water heating system, although two pipes are also used in the overhead system.

The low point of the flow is over the boiler, from which the main rises  $\frac{1}{2}$ -1 inch in 10 feet. The return piping in turn drops 1 inch in 10 feet until it reaches the boiler and then drops vertically to the return inlet.

The main is reduced as branches are taken off. These branches connect with the top of the main, and they should connect through 45 degrees fittings, as right angle turns cause undue friction. Where there is ample head room, and the appearance will not be objectionable, the flow main may be run directly over the return main. This will permit the use of fewer fittings in connecting with branches.

The following table will be found useful in computing the size of mains for a hot water open tank system:

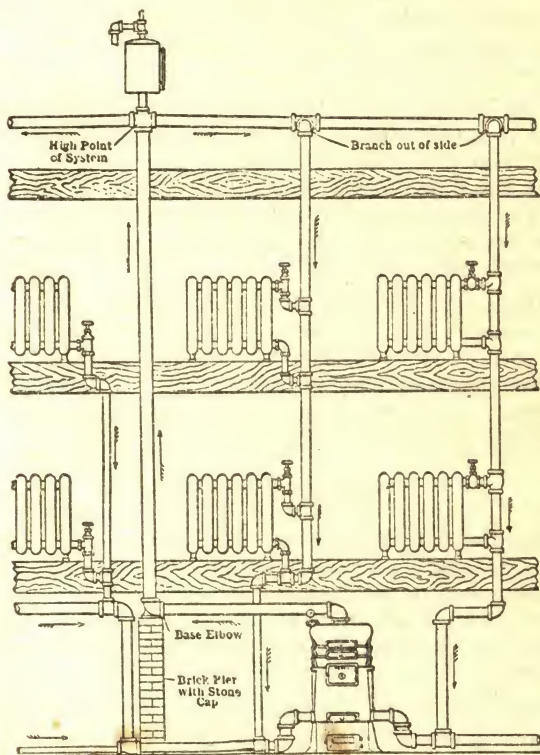
TABLE

Quantity of rad't'g surface up to which the ratio can be used	Ratio in sq. in. main to 100 feet surface at boiler	Ratio main to 100 feet surface 15 feet from boiler	Ratio main to 100 feet surface 30 feet from boiler	Ratio main to 100 feet surface 45 feet from boiler	Ratio main to 100 feet surface 60 feet from boiler	Ratio main to 100 feet surface 75 feet from boiler	Ratio main to 100 feet surface 90 feet from boiler
400	1.20	1.30	1.40	1.50	1.60	1.70	1.80
800	1.10	1.20	1.30	1.40	1.50	1.60	1.70
1,200	1.00	1.10	1.20	1.30	1.40	1.50	1.60
2,000	.90	1.00	1.10	1.20	1.30	1.40	1.50
3,500	.80	.90	1.00	1.10	1.20	1.30	1.40
5,700	.70	.80	.90	1.00	1.10	1.20	1.30
8,500	.60	.70	.80	.90	1.00	1.10	1.20
12,500	.50	.60	.70	.80	.90	1.00	1.10

### EXAMPLE

350 feet of water radiation find size of main required at boiler.  $350 \times 1.20 = 4.20$  area of pipe, see table area, page 197.  $2\frac{1}{2}$  inch pipe area 4.908.

# Piping Systems





# Piping Systems

## The Overhead System

This illustration shows the overhead system in its essential features. While this system may be used for either steam or hot water heating, it is ordinarily employed only for hot water.

The circulation in this system follows from the fact that the water in the vertical supply pipe leading from the boiler, being hotter, is always lighter than the water in the return pipes. The cold water in the return pipes is continually forcing its way into the boiler and forcing the warm water up through the supply pipe.

Due to the fact that the water becomes cooler as it descends, it is necessary to increase the radiation as each floor is reached. The general rule is to figure the radiation for the top floor in the usual manner, add 5 per cent for the second floor and another 5 per cent for the first floor.

## Expansion Tanks

As previous illustrations have indicated, an expansion tank is an essential feature of all hot water systems which are operated without artificial pressure. This tank provides for fluctuations in the volume of the water due to expansion by temperature changes.

The size of the expansion tank depends on the volume of water in the system. However, it may be determined from the total heating surface of the radiators, because the total volume of water is proportional to the total quantity of radiation. The table shown on page 145 will be useful in determining the tank size.



## Piping Systems

The expansion tank should be located 2 or more feet above the highest radiator and some place where it will not freeze in cold weather. A separate 1 inch pipe directly from bottom of boiler to the tank is good practice and advisable whenever possible.

If the tank is to be connected to a riser which is used for a top floor radiator it is advisable to make the connection to the return riser at a point below the connection to radiator.

An overflow pipe is required and it should be run, if possible, to an open sink, or if that is not convenient to the outside air, through the side of the building. There are many objections to this method. However, it is not good practice to run the overflow pipe up through roof because it may remain filled with water long enough to freeze in very cold weather.

If the overflow pipe is carried to the cellar or to a point more than 1 foot below expansion tank it should be provided with an open upper end to break the syphon which would be created when tank is overflowing.

A float is sometimes used in the expansion tank for purpose of filling system automatically if water should be lost through overflow. When this style of tank is used it may be of smaller capacity because the water lost will be immediately replaced when system cools down. In general practice it is not advisable to place a ball float valve in a full size tank, because the overflow will occur only at infrequent intervals, and the ball cock would probably stick and not operate when needed.

Valves on expansion pipe connections are a positive danger and are entirely unnecessary.

### Induced Circulation Vapor Systems

One type of induced circulation is the vapor system. It is in reality a very low pressure steam system.

## Piping Systems

The steam is maintained at a pressure not exceeding 8 ounces and is admitted to the radiators through modulating valves which liberate sufficient steam to fill the radiators entirely or partly, as desired.

Each radiator is also equipped with a return line valve which allows the escape of condensation and air, although it retains the steam. This valve is normally open and closes only when steam attempts to escape.

Under certain conditions there would be a tendency for the water in the boiler to rise into return pipes, but for the differential loop. This device maintains a constant differential pressure between the return and steam mains and in so doing keeps the water in the boiler at a constant level.

The vent valve above the differential loop permits the escape of the air which passes into the return line from the radiators.

### Other Induced Circulation Systems

One of the most commonly used of these is the vapor-vacuum system. It differs from the vapor system principally in that the vapor system operates on a few ounces above atmospheric pressure, while the vapor-vacuum system operates on less than atmospheric pressure. In one of its forms, it is very similar to the system described above. The principal difference in this instance is in the return line valves. These valves are normally closed instead of being open. They allow the escape although preventing the entrance of air. Consequently, the condensing of steam creates a vacuum.

Hot water systems can also be operated under induced circulation. One such is known as the "tank in basement" type. Another is operated without the use of an expansion tank, the excess pressure being taken care of by wasting with automatic refilling.

# Piping Systems

## Equalization of Pipe Areas

* Diam. of Pipes, Ins.	Number of Smaller Pipes Equivalent to One Larger Pipe					
	$\frac{3}{4}$ In.	1 In.	$1\frac{1}{2}$ In.	2 In.	3 In.	4 In.
$\frac{1}{2}$	2.27	4.88	15.8	31.7	96.9	205.0
$\frac{3}{4}$	1.00	2.05	6.9	14.0	42.5	90.4
1	.....	1.00	3.5	6.8	20.9	44.1
$1\frac{1}{2}$	.....	.....	1.0	1.3	6.1	13.0
2	.....	.....	.....	1.0	3.1	6.5
$2\frac{1}{2}$	.....	.....	.....	.....	1.8	3.87
3	.....	.....	.....	.....	1.0	2.12
4	.....	.....	.....	.....	.....	1.0
5	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....

* Diam. of Pipes, Ins.	Number of Smaller Pipes Equivalent to One Larger Pipe					
	5 In.	6 In.	7 In.	8 In.	9 In.	10 In.
$\frac{1}{2}$	377.0	620.0	918.0	.....	.....	.....
$\frac{3}{4}$	166.0	273.0	405.0	569.0	779.0	.....
1	81.1	133.0	198.0	278.0	380.0	536.0
$1\frac{1}{2}$	23.8	39.2	58.1	81.7	112.0	157.0
2	11.9	19.6	29.0	40.8	55.8	78.5
$2\frac{1}{2}$	7.1	11.7	17.4	24.4	33.4	47.0
3	3.9	6.4	9.5	13.3	20.9	23.7
4	1.8	3.0	4.5	6.3	8.6	12.1
5	1.0	1.6	2.4	3.4	4.7	6.6
6	.....	1.0	1.5	2.1	2.8	4.0
7	.....	.....	1.0	1.4	1.9	2.7
8	.....	.....	.....	1.0	1.3	1.9

\*Nominal diameters standard steam- and gas-pipes.

### EXAMPLE

To find number of 2-inch pipes which will deliver as much fluid as one 5-inch pipe: In column headed 5, and opposite 2 read 11.9, which is the equivalent number of 2-inch pipes.

# The Boiler

## Determining Size of Boiler

To determine size of boiler required, add together the losses in B. T. U. for each room to be heated and add 60% of same to cover losses from mains, reserve power and re-kindling charge. Divide this amount by 8,000, which is the number of B.T.U.'s available in one pound of good anthracite coal. The result will be the maximum amount of coal in pounds to be burned per hour.

Pierce surface burning boilers ordinarily burn about 6 pounds of coal per square foot of grate per hour in the round and small sectional boilers and about 8 pounds in the larger boilers.

Divide the amount of coal to be burned per hour as found above by from 6 to 8 according to the type of boiler to be used and the result will be the square feet of grate surface the boiler must have to do the required work.

## Blowing Off a Steam Boiler

A steam boiler should be blown off within one week after it is in operation to remove the unavoidable accumulation of oil, grease, etc., that have a tendency to cause a boiler to foam, preventing the generation of steam and causing an unsteady line. This can only be done when the boiler is under pressure. If one blowing off does not result in a steady water line and clear gauge, the operation must be repeated a second, or, if necessary, a third and fourth time.

1. Remove safety valve and make connection from opening to drain or outside of boiler room, using bushing, valve, and hose or pipe.
2. Close all radiator valves, or if mains are valved, close both flow and return valves tightly, also close cock below diaphragm regulator.



## The Boiler

3. With a wood fire and boiler filled to center of water glass get up pressure of not less than 10 to 12 pounds.

4. Open valve in blow off line from safety valve opening, and when steam pressure is reduced to about 7 pounds open the regular draw off cock at bottom of boiler and blow all remaining water off. While blowing the steam and water off as above *draw all remaining fire* from boiler and open all fire and flue doors. Allow boiler to cool, which usually takes about two to three hours, then close blow off cocks and slowly refill boiler.

5. Open all valves on flow and return lines, the diaphragm cock, and also the radiator valves.

6. Rebuild fire.

7. Repeat the operation until there is a steady water line and a clean gauge glass.

### Cleaning a Water-Gauge Glass on a Steam Boiler

1. Draw a cupful of hot water from the boiler, into which pour at least a tablespoon of raw muriatic or other acid.

2. Close both water-gauge valves.

3. Open top water-gauge valve and also pet cock at bottom, and blow water out of the glass. Then immediately close the top valve and submerge the end of the pet cock in cup of hot water solution. A vacuum is at once created in the gauge glass, which causes the solution in the cup to rush in.

4. Keep the pet cock immersed and operate the top valve, slightly opening and closing, alternately expelling and drawing in the solution until all grease, oil or other matter adhering to the inside of the glass is cut out. Then close pet cock and open both water-gauge valves.

It is necessary to have one pound pressure of steam or more on the boiler before commencing this operation, which need not occupy more than ten minutes. The result is a clean glass without the risk of breakage and probable renewal of gaskets, which is frequently the case when removing the glass for cleaning.

# Ventilation

## Air Required for Ventilation

The following figures have been given by Dr. Billings as the air requirements under different conditions:

	Cu. Ft. Per Hour
Hospitals .....	3600 per occupant
Legislation assembly halls.....	3600 per occupant
Barracks, bedrooms & workshops	3600 per person
Schools and churches.....	2400 per person
Theatres and ordinary halls.....	2000 per seat
Office rooms.....	1800 per person
Dining rooms .....	1800 per person

Below are some other approximate figures that indicate the effect of various other objects on the purity of air and its warmth.

Each cu. ft. gas burned requires 8.5 cu. ft. air.

Each lb. oil burned requires 150 cu. ft. air.

Each lb. candles burned requires 160 cu. ft. air.

B. T. U.'s generated by an adult per hour, 191.

B. T. U.'s generated by burning 1 cu. ft. gas, 600.

B. T. U. generated by burning 1 lb. oil or candles, 15,000 to 18,000.

Average gas burner consumes approximately 4 cu. ft. gas per hour, which equals 2,400 B. T. U. per hour.

Each flame from oil lamp 430 to 515 B. T. U.'s per hour.

Each candle 454 to 445 B. T. U. per hour.

## Specifications of Massachusetts for Heating and Ventilating Public Buildings, Schools, Etc.

That the apparatus will, with proper management, heat all the rooms, including corridors, to 70° in any weather.

2. That with the rooms at 70° and a difference of not less than 40° between the temperature of the outside air and that of the air entering the room at the warm air inlet, the apparatus will supply at least 30 cubic feet of air per minute for each scholar accommodated in the rooms.



## Ventilation

3. That such supply of air will so circulate in the rooms that no uncomfortable draught will be felt, and that the difference in temperature between any two points on the breathing plane (5 ft.) in the occupied portion of a room will not exceed  $3^{\circ}$ .

4. That vitiated air in amount equal to supply from inlets will be removed through the vent ducts.

Tests are made by the anemometer at both inlet and outlet registers to see that the requirements are fulfilled.

### Methods of Ventilation

The ventilation for school houses and large public buildings is usually provided by special apparatus calculated for the requirements.

Natural ventilation is dependent only upon the indirect radiators or coils with exhaust or aspiration flues, while mechanical ventilation makes use of a fan or blower for supplying air to heaters or indirect radiators and also for exhausting through central vent flues.

Usually for ordinary residences no special provision is required, providing there is a central hall and one or more open fire-places which will act as vents or exhaust flues.

It has been estimated that the air leakage to rooms from windows as ordinarily constructed is equal to two changes of air each hour, provided fire-places or other vents are convenient for discharge of vitiated air.

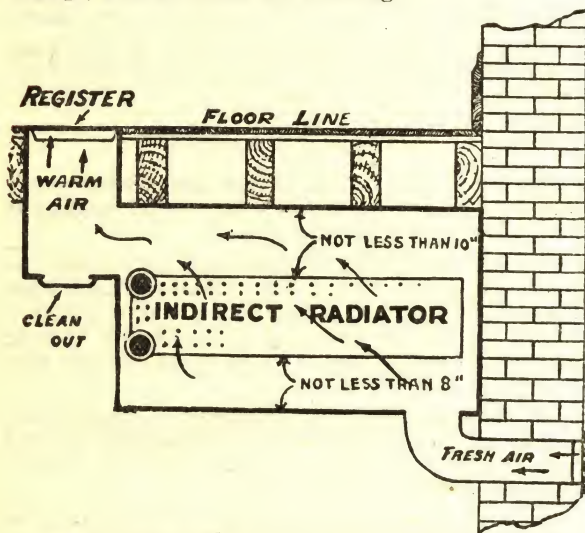
For banquet rooms or other rooms in which many people are liable to assemble at same time, ventilation may be obtained by using an indirect radiator to supply heated air and the open fire-place to exhaust it.

Indirect radiators installed to heat in main halls where very little wall space is found will introduce a considerable volume of heated fresh air, which will distribute itself through the entire building.

# Ventilation

## Indirect Radiators

Pierce indirect radiators are illustrated on pages 92-93. They are installed in the manner indicated by the following cross-section sketch. This sketch shows the proper location of air intake and discharge, also facilities for cleaning.



A fine mesh screen should be stretched across the entrance of the cold air supply duct to keep out dirt, leaves, etc. This duct should also be equipped with a close fitting damper, so that the air supply may be regulated in windy weather.

There should always be a cleanout door located directly under the register in the warm air duct, as indicated in the sketch. This permits the ready removal of any dirt that may fall through the register.

In an indirect heating system the necessary area of the warm air duct may be determined from the table on page 217. The cold air duct will in every instance be 75% of the area of the warm air duct.

# Section Area (Sq. Inches) of Vertical Hot Air Flues

## NATURAL DRAFT INDIRECT SYSTEM

Outside Temperature 50° F.

Flue Temperature 90° F.

Square Feet Cast-iron Radiation	STEAM				WATER			
	1st Story	2nd Story	3rd Story	4th Story	1st Story	2nd Story	3rd Story	4th Story
0 to 50	100	75	63	60	75	63	60	60
50 to 75	150	113	94	80	113	94	80	80
75 to 100	200	150	125	100	150	125	100	100
100 to 125	250	188	156	125	188	156	125	125
125 to 150	300	225	188	150	225	188	150	150
150 to 175	350	263	219	175	263	219	175	175
175 to 200	400	300	250	200	300	250	200	200
200 to 225	450	338	281	225	338	281	225	225
225 to 250	500	375	313	250	375	313	250	250
250 to 275	550	413	344	275	413	344	275	275
275 to 300	600	450	375	300	450	375	300	300
300 to 325	650	488	406	325	488	406	325	325
325 to 350	700	525	438	350	525	438	350	350
350 to 375	750	563	469	375	563	469	375	375
375 to 400	800	600	500	400	600	500	400	400
Velocity, Ft. per Second	2½	4½	5½	6½	1½	2½	4	4
Factor for Effective Area of Register	1.00	1.50	1.83	2.17	1.00	1.00	1.33	1.33

Area of Cold Air Ducts 75% of the above.

Quoted from standard authorities.

# Hot Water Supply

## Determining Size of Tank Coil Needed

### METHOD NO. 1

A steam coil immersed in water will condense about 100 times as much steam as it will when surrounded by still air.

A brass or copper pipe surrounded by water will give off about 180 thermal units per square foot of surface per hour for each degree difference in temperature between the steam and the surrounding water. This is assuming that the water in the tank or boiler is moving over the coil at a moderate velocity. In assuming the temperature of the water, we take the average between that of the inlet and outlet. To arrive at square feet coil necessary to heat any given quantity of water in a given time to a certain temperature—first reduce the gallons of water to pounds; then by taking the temperature of inlet from required temperature we get degrees water is to be raised; these quantities multiplied together give heat units required to raise the water to desired temperature—this will be the dividend. Next get the average temperature by taking one-half the sum of the inlet and outlet temperature; then find the temperature of the steam and deduct from it the average temperature of the water and multiply by 180 for a divisor. Example: How many square feet of heating surface will be required in a brass coil to heat 120 gallons of water per hour from 40 to 120 degrees with steam at 3 lbs. pressure?

Water to be heated.....	$120 \times 8\frac{1}{3} = 1,000$	lbs.
Rise in temperature.....	$120 - 40 = 80$	degrees
Thermal Units required.....	$1000 \times 80 = 80,000$	B T U
Average temp. of water in contact with coils = one-half of.....	$120 + 40 = 80$	degrees
Temp. of steam at 3 lbs. pressure...		$= 220$ degrees
Diff. between 220° and ave. temp...	$80^\circ$	$= 140$ degrees
Then the B. T. U. per sq. foot of surface given up to the water =	$140 \times 180 = 25,200$	
Coil required =	$80,000 \div 25,200 = \text{approx. } 3.2$	sq. ft.



# Hot Water Supply

## METHOD NO. 2

The following table gives gallons of water which one square foot of surface in coil will heat per hour from 40 degrees initial temperature to final temperatures given on top line, both Fahrenheit.

Steam Pressure	Final Temperatures							
	75°	85°	100°	110°	120°	130°	140°	150°
1 lbs.	97.4	73.4	52.3	43.3	36.6	31.3	27.0	23.7
2 lbs.	99.3	74.9	53.4	44.3	37.4	32.1	27.7	24.3
3 lbs.	101.1	76.4	54.5	45.2	38.2	32.7	28.4	24.8
4 lbs.	103.0	77.8	55.6	46.1	39.0	33.5	29.0	25.4
5 lbs.	104.7	79.1	56.6	46.9	39.7	34.2	29.6	26.0
6 lbs.	106.4	80.3	57.5	47.7	40.4	34.8	30.2	26.5
7 lbs.	108.0	81.5	58.4	48.5	41.1	35.4	30.8	27.0
8 lbs.	109.4	82.7	59.3	49.3	41.8	36.0	31.3	27.5
9 lbs.	110.8	83.8	60.1	50.0	42.4	36.6	31.8	28.0
10 lbs.	112.2	84.8	60.9	50.7	43.0	37.1	32.3	28.4

**EXAMPLE:** Find the square feet of heating surface in a coil required to heat 500 gallons of water from 40° to 120° Fahr. in one hour with steam in coil at pressure of 3 pounds.

Under heading of Final Temperatures find the 120° column. Where this column meets the figure opposite 3 pounds in pressure column find 38.2, which is the number of gallons one square foot of coil heating surface will raise to 120° under the given circumstances. Divide 500, the number of gallons to be heated, by 38.2, and the result, 13.1, will be required number of feet of heating surface in coil.

### Determining the Boiler Capacity Needed Where a Coil is Used

If the quantity of water to be heated should be in cubic feet, as in the case of a swimming pool, first determine the initial temperature of this water. Then from the table on page 235 determine the number of pounds a cubic foot of water weighs at this temperature. Multiplying this figure by the cubic feet capacity of the tank will give the pounds weight of the water to be heated. If the gallons capacity of the tank is known, the weight of the water may be determined by multiplying this amount by 8½.

Multiply the pounds weight of the water by the difference between the initial temperature of the



## Hot Water Supply

water and the temperature to which it is to be heated. This will give the number of B. T. U.'s required to heat the water. Divide this amount by the number of hours in which the water must be heated. The result will be the number of B. T. U. required per hour.

Divide the B. T. U.'s per hour by 240 to determine the portion of a steam boiler's rating needed to heat the water or by 150 to determine the portion of a water boiler's rating needed.

### Determining Size of Hot Water Supply Boiler Needed

Where water is heated by a hot water supply boiler, the requirements in B. T. U.'s per hour should be determined as indicated under method No. 1. Dividing this number by the number of heat units available in a pound of coal gives the number of pounds of coal needed per hour. Dividing again by this average coal consumption per hour of this type boiler gives the size of grate needed. A boiler of this type burns about five pounds of coal per square foot of grate, and with good combustion and a good grade of anthracite coal, the available heat units per pound of coal is about 8000. If the water in the example under Method No. 1 were heated by a hot water supply boiler, the boiler grate surface re-

quired would =  $\frac{80,000}{5 \times 8000}$ , or 2 square feet.

This, as will be seen on referring to the ratings of Pierce Hot Water Supply Boiler requires a boiler with a 19 inch grate. To heat the water in two hours would require just half the grate or a boiler with 14 inch diameter grate. In four hours a boiler with 10 inch diameter grate.

## Water and Steam

Heat affects water differently from other fluids. Water at 39.2 degrees Fahrenheit has reached its point of extreme contraction. Upon cooling, it expands until it reaches 32 degrees Fahrenheit, where it solidifies into ice. If it is heated, it expands until it reaches 212 degrees, where it vaporizes into steam.

The figures in the following table are sufficiently accurate for most practical uses.

- 1 cubic foot of water weighs 62.5 pounds.
- 1 cubic inch of water weighs 0.036 pound.
- 7.48 U. S. gallons equal 1 cubic foot.
- 6 Imperial gallons equal 1 cubic foot.
- 1 U. S. gallon weighs 8.33 pounds.
- 1 Imperial gallon weighs 10 pounds.
- 1 U. S. gallon equals 231 cubic inches.

The pressure produced by a column of water is called the static head. The following table shows the pressures produced by columns of water of different heights.

Feet in Height	Lbs. per Sq. In.	Feet in Height	Lbs. per Sq. In.	Feet in Height	Lbs. per Sq. In.
1	.43	15	6.49	50	21.65
2	.86	20	8.66	70	30.32
5	2.16	25	10.82	80	34.65
10	4.33	40	17.32	100	43.31

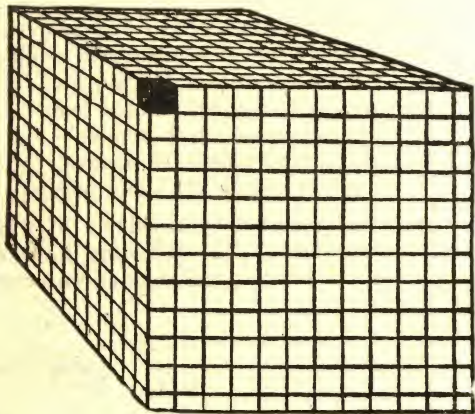
As the table on the opposite page shows, for every altitude, there is a definite temperature at which water will boil. At atmospheric pressure—17.4 lbs. per square inch—this temperature is 212 degrees Fahrenheit.

If a certain quantity of water at 39.2 degrees Fahrenheit is heated to the boiling point and evaporated into steam the volume of the steam will be 1,646 times as great as the original volume of the

## Water and Steam

water from which it was evaporated. The change in volume of a given amount of water at 212 degrees to steam at the same temperature is one to 1577.

The illustration below shows graphically the change that takes place.



The black cube in the upper corner represents one cubic inch of water. The entire cube represents the space occupied by the cubic inch of water in the form of steam. The reduced spaces at the bottom and sides show how much short the cube is of being one cubic foot.

# Water and Steam

## Heat Units in Water

Between 32 and 212 Degrees Fahrenheit, and  
Weight of Water Per Cubic Foot

Tem- pera- ture Dg.F.	Heat Units	Wt. in lbs per cu. ft.	Tem- pera- ture Dg.F.	Heat Units	Wt. in lbs. per cu. ft.	Tem- pera- ture Dg.F.	Heat Units	Wt. in lbs. per cu. ft.
32	0.	62.42	123	91.16	61.68	168	136.44	60.81
35	3.	62.42	124	92.17	61.67	169	137.45	60.79
40	8.	62.42	125	93.17	61.65	170	138.45	60.77
45	13.	62.42	126	94.17	61.63	171	139.46	60.75
50	18.	62.41	127	95.18	61.61	172	140.47	60.73
52	20.	62.40	128	96.18	61.60	173	141.48	60.70
54	22.01	62.40	129	97.19	61.58	174	142.49	60.68
56	24.01	62.39	130	98.19	61.56	175	143.50	60.66
58	26.01	62.38	131	99.20	61.54	176	144.51	60.64
60	28.01	62.37	132	100.20	61.52	177	145.52	60.62
62	30.01	62.36	133	101.21	61.51	178	146.52	60.59
64	32.01	62.35	134	102.21	61.49	179	147.53	60.57
66	34.02	62.34	135	103.22	61.47	180	148.54	60.55
68	36.02	62.33	136	104.22	61.45	181	149.55	60.53
70	38.02	62.31	137	105.23	61.43	182	150.56	60.50
72	40.02	62.30	138	106.23	61.41	183	151.57	60.48
74	42.03	62.28	139	107.24	61.39	184	152.58	60.46
76	44.03	62.27	140	108.25	61.37	185	153.59	60.44
78	46.03	62.25	141	109.25	61.36	186	154.60	60.41
80	48.04	62.23	142	110.26	61.34	187	155.61	60.39
82	50.04	62.21	143	111.26	61.32	188	156.62	60.37
84	52.04	62.19	144	112.27	61.30	189	157.63	60.34
86	54.05	62.17	145	113.28	61.28	190	158.64	60.32
88	56.05	62.15	146	114.28	61.26	191	159.65	60.29
90	58.06	62.13	147	115.29	61.24	192	160.67	60.27
92	60.06	62.11	148	116.29	61.22	193	161.68	60.25
94	62.06	62.09	149	117.30	61.20	194	162.69	60.22
96	64.07	62.07	150	118.31	61.18	195	163.70	60.20
98	66.07	62.05	151	119.31	61.16	196	164.71	60.17
100	68.08	62.02	152	120.32	61.14	197	165.72	60.15
102	70.09	62.00	153	121.33	61.12	198	166.73	60.12
104	72.09	61.97	154	122.33	61.10	199	167.74	60.10
106	74.10	61.95	155	123.34	61.08	200	168.75	60.07
108	76.10	61.92	156	124.35	61.06	201	169.77	60.05
110	78.11	61.89	157	125.35	61.04	202	170.78	60.02
112	80.12	61.86	158	126.36	61.02	203	171.79	60.00
114	82.13	61.83	159	127.47	61.00	204	172.80	59.97
115	83.13	61.82	160	128.37	60.98	205	173.81	59.95
116	84.13	61.80	161	129.38	60.96	206	174.83	59.92
117	85.14	61.78	162	130.39	60.94	207	175.84	59.89
118	86.14	61.77	163	131.40	60.92	208	176.85	59.87
119	87.15	61.75	164	132.41	60.90	209	177.86	59.84
120	88.15	61.74	165	133.41	60.87	210	178.87	59.82
121	89.15	61.72	166	134.42	60.85	211	179.89	59.79
122	90.16	61.70	167	135.43	60.83	212	180.90	59.76



# Water and Steam

## Properties of Saturated Steam

Boil- ing Tem.	Absolute Pressure Sq. In.	Inches Vacuum	Steam Gauge Pressure Lbs.	Latent Heat	Liquid Heat	Vol. 1 lb. Steam Cu. Ft.
157	4.408	20.94	....	1003.4	124.86	82.6
161	4.851	20.04	....	1001.6	127.86	77.2
165	5.333	19.06	....	998.7	132.86	69.1
169	5.855	18.00	....	996.4	136.36	63.3
172	6.273	17.15	....	994.6	139.87	59.4
176	6.867	15.94	....	992.3	143.87	54.5
179	7.344	14.97	....	990.5	146.88	51.2
182	7.85	13.94	....	988.7	149.89	48.12
185	8.38	12.85	....	986.9	152.89	45.25
187	8.76	12.09	....	985.7	154.90	43.45
190	9.34	10.90	....	983.9	157.91	40.91
192	9.74	10.09	....	982.7	159.91	39.31
194	10.17	9.21	....	981.5	161.92	37.78
197	10.83	7.87	....	979.7	164.93	35.62
199	11.29	6.93	....	978.8	166.94	34.26
201	11.76	5.97	....	977.2	168.94	32.96
203	12.26	4.96	....	976.0	170.95	31.72
205	12.77	3.92	....	974.7	172.96	30.53
207	13.30	2.84	....	973.5	174.97	29.39
209	13.85	1.73	....	972.2	176.98	28.32
210	14.13	1.16	....	971.6	177.99	27.80
212	14.70	....	....	970.4	180.00	26.79
215	15.60	....	0.90	968.4	183.00	25.35
217	16.22	....	1.72	967.2	185.00	24.44
219	16.86	....	2.16	965.9	187.10	23.57
222	17.87	....	3.17	963.9	190.10	22.34
225	18.91	....	4.21	962.0	193.10	21.17
227	19.64	....	4.94	960.7	195.20	20.44
230	20.77	....	6.07	958.7	198.20	19.39
232	21.56	....	6.86	957.4	200.20	18.72
235	22.79	....	8.09	955.4	203.2	17.78
237	23.64	....	8.94	954.1	205.3	17.17
240	24.97	....	10.27	952.1	208.3	16.32
242	25.88	....	11.17	950.7	210.3	15.78
244	26.83	....	12.13	949.4	212.4	15.26
246	27.80	....	13.10	948.0	214.4	14.76
248	28.80	....	14.10	946.7	216.4	14.28
250	29.82	....	15.12	945.3	218.5	13.82
252	30.88	....	16.18	943.9	220.5	13.37
255	32.53	....	17.83	941.9	223.5	12.74
257	33.66	....	18.96	940.5	225.6	12.34
259	34.83	....	20.13	939.1	227.6	11.95



## Coal

**Coking Coal.** All bituminous coals coke when burning. The process of coking consists of driving off the volatile matter contained in coal as well as the moisture. When this gaseous content is driven off, the residue is carbon or coke. The amount of coke remaining depends upon the amount of volatile matter and moisture originally contained in the coal. This process takes place in semi-bituminous, bituminous, sub-bituminous and lignite coals and is identical in all.

**Caking Coal.** Caking coals are those which have a strong tendency to "bridge," or in other words, to fuse together into a mass which closes the air passages through the fuel bed, thereby diminishing the air supply. This occurs particularly in eastern bituminous and semi-bituminous coals.

**Free Burning Coal.** The term free burning is self-explanatory and applies to all fuels which burn freely, with no tendency to bridge or fuse together and which do not cause a restriction of the passage of air through the fuel bed. A coking coal is free burning; caking coal is not.

Pierce Boilers are not restricted to any one kind of coal. If caking coals are used, however, it will be necessary to slice the fire more often in order to break up the fuel bed, and allow the proper passage of air. Free burning coals require less attention. Smokeless combustion with soft coal may be secured with the Pierce Smokeless Updraft Boiler or the Pierce Down Draft Boiler. We do not recommend the use of caking coals in the Pierce Down Draft Boiler.

# Coal

## Fuel Values

Calorific Values per Pound of Combustible in B. T. U.'s

Anthracite Coal .....	12,000 to 14,500
Bituminous .....	11,500 to 15,800
Petroleum .....	18,500 to 20,000
Corn .....	8,200 to 8,400
Corn and Cob .....	7,800 to 8,000
Corn Cob .....	7,300 to 7,500
Dry Sawdust.....	6,100
Air Dried Peat.....	7,391
Perfectly Dried Peat.....	10,600

Cubic Foot Natural Gas = 1,000 B. T. U.'s.

Cubic Foot Manufactured Gas = 600 B. T. U.'s.

2¼ lbs. Dry Cord Wood equivalent to 1 lb. Coal.

For low-pressure heating purposes, from 5 to 9 pounds of coal per hour are usually considered for each square foot of grate surface in a boiler; for high pressure, as high as 12 to 15 pounds per hour for each square foot of grate.

## Heating Terms in General Use

**Actual Evaporation.** By this term is meant the total quantity of water (in pounds) evaporated from the temperature of the feed water to steam at 212 degrees Fahrenheit.

**Atmospheric Pressure.** The pressure exerted by the atmosphere may be established by the simple experiment of taking a glass tube with an area of 1 square inch and approximately 30 inches high, with one end closed; filling same with mercury and inverting the tube in mercury, it will be found at the sea-level that the mercury will stand in the column 29.9 inches high, or practically 30 inches. As 1 cubic foot of mercury weighs 850 pounds, 1 cubic inch would weigh 0.49 pounds; and as the mercury in the tube under the pressure of the atmosphere stands 30 inches high, and the area is 1 square inch, there would be 30 cubic inches of mercury in the tube, which would weigh  $30 \times 0.49$ , or 14.7 pounds. As this column of mercury, weighing 14.7, is entirely sustained by the pressure of the atmosphere, it may be stated that the normal pressure at sea-level is 14.7 pounds per square inch. This pressure varies with the altitude and under different conditions of the barometer.

**Boiler Heating Surface—Direct.** That surface which receives the radiant heat of the fire, or that surface on which the fire shines.

The transmission of heat through direct surface is practically constant for like temperature differences.

**Boiler Heating Surface—Indirect Flue.** That surface in a boiler on which the fire does not shine, but through which the constantly cooling gases pass to the smokestack.

The value of indirect, or flue surface, is extremely variable, because the escaping gases are constantly cooling; the rate of transmission becomes less and less as the gases approach the smoke outlet.

**B. T. U. (British Thermal Unit, Heat Unit).** The quantity of heat required to raise 1 pound of water 1 degree Fahrenheit.

## Heating Terms in General Use

**Co-efficient of Heat Emission.** This term is usually applied to the heat emitted, or given off, by 1 square foot of radiation per hour for 1 degree temperature difference between the steam or water in the radiator and the surrounding air.

**Co-efficient of Transmission** is the quantity of heat, expressed in terms of B. T. U.'s, which will pass through 1 square foot of surface in one hour for 1 degree temperature difference.

**Combustion Chamber.** That portion of fire-pot or firebox between the surface of fuel-bed and the crown sheet of heater.

**Combustion, Rate of.** The rate of combustion is a term usually applied to the quantity of coal burned per square foot of grate per hour. The term may also be used to designate the quantity of fuel burned by the boiler per hour.

**Condensing Power (of Radiation).** The condensing power of radiation is the quantity of steam (in pounds) which a radiator will condense per square foot per hour.

**Conduction.** Conduction is the transfer of heat between two bodies or parts of a body which touch each other. Internal conduction takes place between the parts of one continuous body, and external conduction through the surface of contact of a pair of distinct bodies.

**Convection.** Convection, or carrying of heat, means the transfer or diffusion of the heat in a fluid mass by means of the motion of the particles of that mass.

The conduction, properly so called, of heat through a stagnant mass of fluid is very slow in liquids, and almost, if not wholly, inappreciable in gases. It is only by the continual circulation and mixture of the particles of the fluid that uniformity of temperature can be maintained in the fluid mass, or heat transferred between the fluid mass and a solid body.



## Heating Terms in General Use

**Efficiency (Boiler), (Based on Coal Consumption).** The percentage of calorific power absorbed by the water in the boiler.

**Equivalent Evaporation** is the total quantity of water (in pounds) evaporated from a temperature of 212 to steam at 212 degrees Fahrenheit.

**Evaporation.** The act of resolving, or the state of being resolved, into vapor. The conversion of boiling water by heat into vapor or steam.

**Evaporative Power (of a Boiler)** is the quantity of water (in pounds) which 1 pound of coal burned in said boiler will evaporate.

**Evaporative Power (of Fuel).** The quantity of water (in pounds) which 1 pound of fuel will evaporate in burning. Theoretical evaporation is the quantity of water evaporated by 1 pound of fuel burning to perfect combustion.

**Heating Surface (H. S.).** The heating surface of a boiler is that portion of the inner walls separating the fire or heated gases from the water.

**Heat Transmission.** When the temperatures on opposite sides of any surface are unequal, the heat will flow through the material from the warmer to the cooler side. This is called heat transmission.

**Ignition Temperature.** The ignition temperature of a substance is that temperature to which it must be raised in the presence of oxygen to cause the two to unite by combustion. It is rather indefinite and varies for different types of fuel. The exact temperature can only be determined by direct experiment with the particular variety of fuel under test. For coal it is approximately considered 800 degrees Fahrenheit.

**Latent Heat** is that quantity of heat necessary to evaporate 1 pound of water into steam at same temperature.



# Number of U. S. Gallons in Tanks

Length or Depth in Feet	DIAMETER IN INCHES															
	18	24	30	36	42	48	54	60	66	72	78	84	90	96	108	120
2	26	47	73	105	144	188	238	294	356	424	497	577	662	750	954	1,178
2½	33	59	90	131	180	235	298	367	445	530	621	721	827	937	1,192	1,472
3	40	71	109	157	216	282	357	440	534	636	745	865	992	1,124	1,430	1,766
3½	47	83	127	183	252	329	416	513	623	742	869	1,009	1,157	1,311	1,668	2,060
4	54	95	145	209	288	376	475	586	712	848	993	1,153	1,322	1,498	1,904	2,354
4½	61	107	163	235	324	423	534	659	801	954	1,117	1,297	1,487	1,685	2,144	2,648
5	68	119	180	261	360	470	593	732	890	1,060	1,241	1,441	1,652	1,872	2,342	2,942
5½	75	131	200	287	396	517	652	805	979	1,166	1,365	1,585	1,817	2,059	2,620	3,236
6	82	143	217	313	432	564	711	878	1,068	1,272	1,489	1,729	1,982	2,246	2,858	3,530
6½	89	155	235	339	468	611	770	951	1,157	1,378	1,613	1,873	2,147	2,433	3,096	3,824
7	96	167	253	365	504	658	829	1,024	1,246	1,484	1,737	2,017	2,312	2,620	3,334	4,118
7½	103	179	271	391	540	705	888	1,097	1,335	1,590	1,861	2,161	2,477	2,807	3,572	4,412
8	110	191	289	417	576	752	947	1,170	1,424	1,696	1,985	2,305	2,642	2,994	3,810	4,706
8½	...	203	307	443	612	799	1,006	1,243	1,513	1,802	2,109	2,449	2,807	3,181	4,048	5,000
10	...	239	361	521	720	940	1,183	1,462	1,780	2,120	2,481	2,881	3,302	3,742	4,762	5,882
11	...	287	433	625	864	1,128	1,419	1,754	2,136	2,544	2,977	3,457	3,962	4,490	5,714	7,058
14	...	...	...	...	1,008	1,316	1,655	2,046	2,492	2,968	3,473	4,033	4,622	5,238	6,666	8,234
16	...	...	...	...	1,152	1,504	1,891	2,338	2,848	3,392	3,969	4,609	5,282	5,986	7,618	9,410
18	...	...	...	...	...	...	2,127	2,630	3,204	3,816	4,465	5,185	5,942	6,734	8,570	10,586
20	...	...	...	...	...	...	2,363	2,922	3,560	4,240	4,961	5,761	6,602	7,482	9,522	11,762

Quoted from standard authorities.

## Areas of Circles

Dia.	Area	Dia.	Area	Dia.	Area	Dia.	Area
$\frac{1}{8}$	0.0123	10	78.54	30	706.86	65	3318.3
$\frac{1}{4}$	0.0491	$\frac{1}{2}$	86.59	31	754.76	66	3421.2
$\frac{3}{8}$	0.1104	11	95.03	32	804.24	67	3525.6
$\frac{1}{2}$	0.1963	$\frac{1}{2}$	103.86	33	855.30	68	3631.6
$\frac{5}{8}$	0.3067	12	113.09	34	907.92	69	3739.2
$\frac{3}{4}$	0.4417	$\frac{1}{2}$	122.71	35	962.11	70	3848.4
$\frac{7}{8}$	0.6013	13	132.73	36	1017.8	71	3959.2
1	0.7854	$\frac{1}{2}$	143.13	37	1075.2	72	4071.5
$\frac{1}{8}$	0.9940	14	153.93	38	1134.1	73	4185.3
$\frac{1}{4}$	1.227	$\frac{1}{2}$	165.13	39	1194.5	74	4300.8
$\frac{3}{8}$	1.484	15	176.71	40	1256.6	75	4417.8
$\frac{1}{2}$	1.767	$\frac{1}{2}$	188.69	41	1320.2	76	4536.4
$\frac{5}{8}$	2.073	16	201.06	42	1385.4	77	4656.0
$\frac{3}{4}$	2.405	$\frac{1}{2}$	213.82	43	1452.2	78	4778.3
$\frac{7}{8}$	2.761	17	226.98	44	1520.5	79	4901.6
2	3.141	$\frac{1}{2}$	240.52	45	1590.4	80	5026.5
$\frac{1}{4}$	3.976	18	254.46	46	1661.9	81	5153.0
$\frac{1}{2}$	4.908	$\frac{1}{2}$	268.80	47	1734.9	82	5281.0
$\frac{3}{4}$	5.939	19	283.52	48	1809.5	83	5410.6
3	7.068	$\frac{1}{2}$	298.64	49	1885.7	84	5541.7
$\frac{1}{4}$	8.295	20	314.16	50	1963.5	85	5674.5
$\frac{1}{2}$	9.621	$\frac{1}{2}$	330.06	51	2042.8	86	5808.8
$\frac{3}{4}$	11.044	21	346.36	52	2123.7	87	5944.6
4	12.566	$\frac{1}{2}$	363.05	53	2206.1	88	6082.1
$\frac{1}{2}$	15.904	22	380.13	54	2290.2	89	6221.1
5	19.635	$\frac{1}{2}$	397.60	55	2375.8	90	6361.7
$\frac{1}{2}$	23.758	23	415.47	56	2463.0	91	6503.8
6	28.274	$\frac{1}{2}$	433.73	57	2551.7	92	6647.6
$\frac{1}{2}$	33.183	24	452.39	58	2642.0	93	6792.9
7	38.484	$\frac{1}{2}$	471.43	59	2733.9	94	6939.7
$\frac{1}{2}$	44.178	25	490.87	60	2827.4	95	7088.2
8	50.265	26	530.93	61	2922.4	96	7238.2
$\frac{1}{2}$	56.745	27	572.55	62	3019.0	97	7389.8
9	63.617	28	615.75	63	3117.2	98	7542.9
$\frac{1}{2}$	70.882	29	660.52	64	3216.9	99	7697.7

To find the area of a circle when diameter is given, multiply the square of the diameter by .7854.

## Circumference of Circles

Dia.	Circum- ference	Dia.	Circum- ference	Dia.	Circum- ference	Dia.	Circum- ference
$\frac{1}{8}$	.3927	10	31.416	30	94.248	65	204.204
$\frac{1}{4}$	.7854	$\frac{1}{2}$	32.987	31	97.389	66	207.345
$\frac{3}{8}$	1.1781	11	34.558	32	100.531	67	210.487
$\frac{1}{2}$	1.5708	$\frac{1}{2}$	36.128	33	103.673	68	213.628
$\frac{5}{8}$	1.9635	12	37.699	34	106.814	69	216.770
$\frac{3}{4}$	2.3562	$\frac{1}{2}$	39.270	35	109.956	70	219.911
$\frac{7}{8}$	2.7489	13	40.841	36	113.097	71	223.053
1	3.1416	$\frac{1}{2}$	42.412	37	116.239	72	226.195
$\frac{1}{8}$	3.5343	14	43.982	38	119.381	73	229.336
$\frac{1}{4}$	3.9270	$\frac{1}{2}$	45.553	39	122.522	74	232.478
$\frac{3}{8}$	4.3197	15	47.124	40	125.664	75	235.619
$\frac{1}{2}$	4.7124	$\frac{1}{2}$	48.695	41	128.805	76	238.761
$\frac{5}{8}$	5.1051	16	50.265	42	131.947	77	241.903
$\frac{3}{4}$	5.4978	$\frac{1}{2}$	51.836	43	135.088	78	245.044
$\frac{7}{8}$	5.8905	17	53.407	44	138.230	79	248.186
2	6.2832	$\frac{1}{2}$	54.978	45	141.372	80	251.327
$\frac{1}{4}$	7.0686	18	56.549	46	144.513	81	254.469
$\frac{1}{2}$	7.8540	$\frac{1}{2}$	58.119	47	147.655	82	257.611
$\frac{3}{4}$	8.6394	19	59.690	48	150.796	83	260.752
3	9.4248	$\frac{1}{2}$	61.261	49	153.938	84	263.894
$\frac{1}{4}$	10.210	20	62.832	50	157.080	85	267.035
$\frac{1}{2}$	10.996	$\frac{1}{2}$	64.403	51	160.221	86	270.177
$\frac{3}{4}$	11.781	21	65.973	52	163.363	87	273.319
4	12.566	$\frac{1}{2}$	67.544	53	166.504	88	276.460
$\frac{1}{2}$	14.137	22	69.115	54	169.646	89	279.602
5	15.798	$\frac{1}{2}$	70.686	55	172.788	90	282.743
$\frac{1}{2}$	17.279	23	72.257	56	175.929	91	285.885
6	18.850	$\frac{1}{2}$	73.827	57	179.071	92	289.027
$\frac{1}{2}$	20.420	24	75.398	58	182.212	93	292.168
7	21.991	$\frac{1}{2}$	76.969	59	185.354	94	295.310
$\frac{1}{2}$	23.562	25	78.540	60	188.496	95	298.451
8	25.133	26	81.681	61	191.637	96	301.593
$\frac{1}{2}$	26.704	27	84.823	62	194.779	97	304.734
9	28.274	28	87.965	63	197.920	98	307.876
$\frac{1}{2}$	29.845	29	91.106	64	201.062	99	311.018

To find the circumference of a circle when diameter is given, multiply the given diameter by 3.1416.

Quoted from standard authorities.

## Conversion Table

One Cubic Inch of Cast Iron weighs.....	0.26 pound
One Cubic Inch of Wrought Iron weighs..	0.28 pound
One Cubic Inch of Water at 62 degrees weighs .....	0.036 pound
One Cubic Inch of Water at 62 degrees weighs .....	62.321 pounds
One United States gallon weighs.....	8.33 pounds
One Quart of Water weighs.....	2.08 pounds
One United States Gallon equals.....	231 cubic inches
One Cubic Foot of Water equals.....	7.48 U. S. gallons
One Pound of Steam equals.....	27,222 cubic feet
One Pound of Air equals.....	13.817 cubic feet
One Heaped Bush. Anth. Coal weighs 75 to 80 pounds	
One Heaped Bush. Bitum Coal weighs .....	70 to 75 pounds
One Bushel Coke weighs.....	32 pounds
B. T. U. $\div$ 33,000 = H. P.	
B. T. U. $\div$ 250 = Steam Radiation. Square feet.	
B. T. U. $\div$ 150 = Water Radiation. Square feet.	
B. T. U. $\div$ 55 = Cubic Feet Air Warmed 1 degree per hour.	
B. T. U. $\div$ 1. = pounds. Water raised 1 degree.	
Diameter $\times$ 3.1416 = Circumference.	
Diameter $\times$ .8862 = Side of an Equal Square.	
Diameter squared $\times$ .7854 = Area of a Circle.	
Circumference $\div$ 3.1416 = Diameter.	
Circumference $\div$ 6.28318 = Radius.	
Circumference $\times$ $\frac{1}{4}$ the Diameter = Area of a Circle.	
Square inches $\times$ .007 = Square feet.	
Cubic inches $\times$ .00058 = Cubic feet.	



## Boiler Horse Power

The American Society of Mechanical Engineers has defined one horse power when applied to heating boilers, as the evaporation of 34.5 pounds of water per hour from and at 212° F.

The above is equivalent to the development of 33,327 B. T. U.'s per hour.

Under above conditions the horse power is equal to about 138 square feet of radiation where  $\frac{1}{4}$  pound of steam is condensed by 1 foot of radiation.

To reduce boiler capacity to approximate horse power, divide the steam rating in feet by 138.

## Thermometers

In the Fahrenheit scale the freezing point of water is registered at 32 degrees above zero and the boiling point at 212 degrees above zero; both at atmospheric pressure.

In the Centigrade scale the freezing point of water is registered at zero and the boiling point at 100 degrees above zero; both at atmospheric pressure.

To convert Centigrade scale readings into Fahrenheit, multiply by 9, divide this product by 5 and add 32 degrees.



## Boiler Capacity and Horse-Power

While heat and mechanical energy are mutually convertible, the term "horse-power" does not suggest heat energy. This is one potent reason why "horse-power" is not a suitable unit of capacity measurement for boilers that are used exclusively for heating purposes. There are, however, some engineers who have been trained to think of heating power in terms of boiler "horse-power" and for this reason the following data is given with the hope that it may at times be helpful to both buyers and sellers of heating boilers. Kent's M. E. Pocket-Book (8th edition) states that:

"The A. S. M. E. Committee on Boiler Tests, 1884, defined it (horse-power) as equivalent to 34.5 lbs. evaporated per hour, from a feed-water temperature of 212 degrees into steam at the same temperature. The committee of 1899 adopted this definition, 34.5 lbs. per hour, from and at 212 degrees, as the unit of commercial horse-power. Using the figures for total heat of steam given in Marks and Davis' steam tables (1909), 34.5 lbs. from and at 212 degrees, is equivalent to 33,479 B. T. U.'s per hour, or to an evaporation of 30.018 lbs. from 100 degrees feed-water temperatures into steam at 70 lbs. pressure."

1. One square foot of active heating surface will evaporate from 3 to 6 pounds of water per hour, from and at 212 degrees Fahrenheit.

2. 34.5 pounds of water per hour evaporated from and at 212 degrees Fahrenheit equals 1 "horse-power."

3. The quantity of heating surface per "horse-power" depends upon the rate of evaporation and varies in different types of boilers and different draft intensities from 6 to 12 square feet. For the same

## Boiler Capacity and Horse-Power

reason 1 square foot of heating surface will supply from 12 to 24 square feet of steam radiation without undue fuel waste.

4. One "horse-power" will supply 138 square feet of average cast-iron radiation under normal conditions of installation ( $34.5 \times 4 = 138$ ), and under such conditions 4 square feet of radiation is required to condense 1 pound of steam per hour. The hourly evaporation in pounds times 4 gives the heating power in terms of radiation.

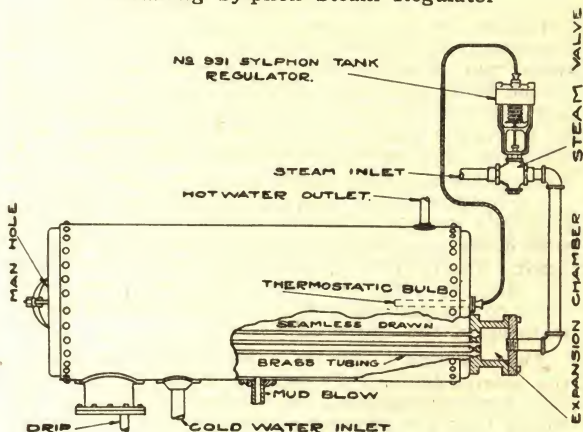
5. If the evaporation per square foot of heating surface per hour is 2 pounds, the radiation capacity is ( $4 \times 2$ ) 8 square feet of heating surface, and the capacity of a boiler containing 60 square feet of heating surface would be ( $60 \times 8$ ) 480 square feet of steam radiation.

6. If the evaporation per square foot of heating surface per hour is 5 pounds, the radiation capacity is ( $4 \times 5$ ) 20 square feet per square foot of heating surface, and the capacity of a boiler containing 60 square feet of heating surface would be ( $60 \times 20$ ) 1,200 square feet.

7. The "horse-power" of a Pierce boiler may be determined by dividing its rated capacity by 138.

# Regulators

## Installing Syphon Steam Regulator



After boiler is set up and under fire, raise whatever steam pressure it is desired to maintain, say 2 pounds.

When the gauge shows 2 pounds, adjust the weight "B" on the regulator lever so that the chain connecting tilting draft damper "E" and check draft damper "F" is just taut, both dampers being closed. Then, when the front draft "E" is open a little and check draft "F" closed, there will be a little slack in the chain as shown at the right, or vice versa. The slack naturally comes in stretch of chain along ceiling, but slack at "H" shows relative amount.

If any greater pressure is generated the check damper "F" will open and check the combustion; the pressure will lower to 2 pounds; then the check damper will close. If the fire is clean, the pressure will gradually increase without opening the tilting draft "E" and the regulator will create the check draft only until the grate becomes covered with ashes; then the pressure will drop below 2 pounds, and the regulator will operate the tilting draft door on the ash pin.

For best results chains should be connected so that draft "E" opens but slightly and check draft "F" opens wide.

The chains should never be disconnected from the doors; but any adjustment of pressures should be regulated by moving the weight "B" on the lever. From fulcrum "A" to end of lever "D" should never be more than 18 inches.

# Chimney Flues

## Old Chimneys

Under this heading we are approaching this all important subject from the standpoint of the steam-fitter, who is confronted with the task of replacing an old boiler and must make the best of the prevailing chimney conditions. Where a new chimney is to be built, the information under the heading "New Chimney" furnishes a more satisfactory guide.

Probably no other single cause is responsible for so many failures in heating as defective chimneys. It should always be borne in mind and emphasized with every prospective customer that no boiler has a draft. The draft of the boiler depends entirely upon the chimney flue, and the better the chimney, all other conditions being equal, the more successful the working of the entire apparatus.

The size and height of chimney absolutely limits the size of boiler that can be used. To illustrate: For general residence work the manufacturer assumes that the average chimney will have a height above the ground of from 30 to 40 feet, and in his catalogue he gives the sizes of smoke pipe which he recommends for a given size of boiler. Now, assuming that the required boiler has a 10-inch smoke collar, it is manifestly improbable that satisfactory results can be obtained if that boiler is connected to a flue with an interior dimension of 5x12 inches or 8x8 inches. The house owner may be entirely correct when he affirms that "the flue always had a good draught," or that "it worked with a furnace," or such similar statements. The fact remains that it is impossible to successfully compress the products of combustion that require 78 square inches area into an area of 60 to 64 square inches.

The heating contractor should personally satisfy himself that the chimney flue meets all the conditions mentioned on the following page, and has a clear area equal or exceeding that of the smoke pipe recommended by the manufacturer for the proposed heater, or else he should decline the job.

Chimney flues for heating apparatus should be ample in size and carried as nearly straight as possible from a point near the cellar floor to above the highest projection of the roof. They should be independent, having no connection with other flues or



## Chimney Flues

openings, and always of the same area from top to bottom. A well jointed tile flue, preferably round, is better than a square brick flue of larger area. The joints between tiles must be tightly cemented and inside dimensions of tile is the size of the flue.

In looking over the chimney and connecting boiler to it, it is well:

FIRST—To see that there are no other openings into the boiler flue, either above or below the boiler smoke-pipe.

SECOND—That the division walls of the chimney, if it contains more than one flue, are carried up to the top of the chimney, and down to the bottom of the chimney, so that each flue is independent of the others throughout its entire length.

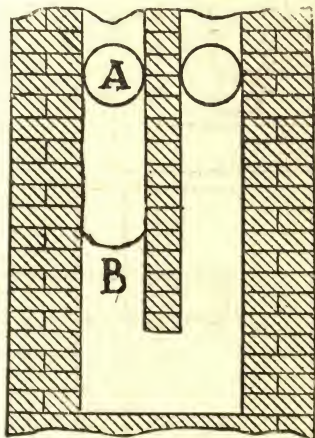


Fig. 1.

The condition indicated in this diagram is very commonly encountered. Here two flues are joined together at the bottom. The smoke pipe from the boiler enters at A. This situation can be remedied by inserting a sheet of iron in the flue tightly at B.

Often trouble is caused by the use of one clean out door for two flues in the manner indicated in Fig. 2. This must be remedied by providing a cleanout door for each flue as indicated in Fig. 3.



# Chimney Flues

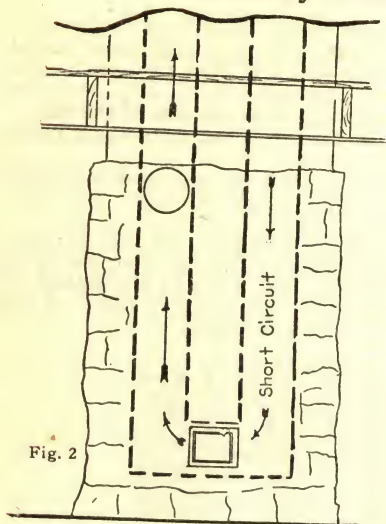


Fig. 2

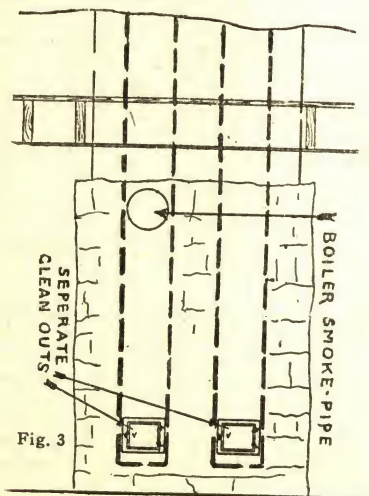


Fig. 3

## Chimney Flues

The existence of an opening of this type at the bottom of the flue or of a leak of any other type may be readily detected by twisting a newspaper, lighting

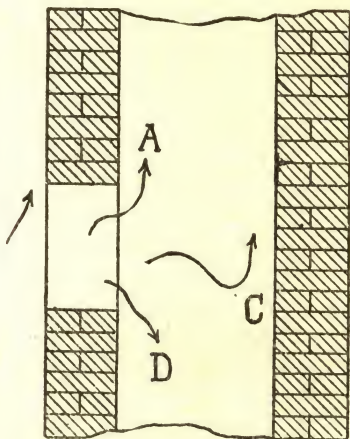


Fig. 4

and holding it against the opening where the boiler smoke pipe enters the chimney flue. If part of the flame goes downward, as shown by Arrow D in Fig. 4, this will be an indication that there is a leakage below the smoke-pipe entrance.

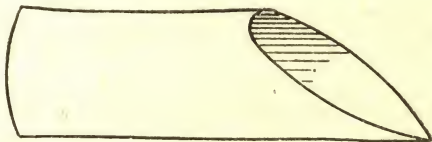


Fig. 5

Where it is necessary for cleaning purposes to have the flue extended below the smoke pipe en-

## Chimney Flues

trance, unsatisfactory results may be avoided by giving the end of the smoke pipe the form indicated in the above sketch. This is known as a "toothpick joint." Care must be taken to see that the pipe does not become turned the wrong way.

THIRD—That the area of the chimney flue is maintained full size throughout its entire length, and is free from all obstructions, such as loose brick, mor-

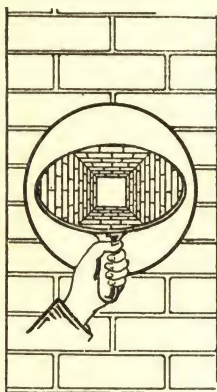


Fig. 6

tar, etc., that might have become lodged in it. An offset in flue to go around an upper fire place should have increased area to overcome added friction.

A mirror may sometimes be used to detect obstructions as suggested in this illustration.

FOURTH—That chimney extends above the highest point of the roof or other immediate surrounding elevations, such as adjoining buildings, hills, trees, etc. This is quite important, and failure to observe same may be looked to as cause for poor draft.

## Chimney Flues

Some of the forms this difficulty may take are indicated in the following sketches.

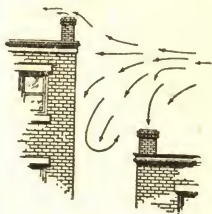


Fig. 7

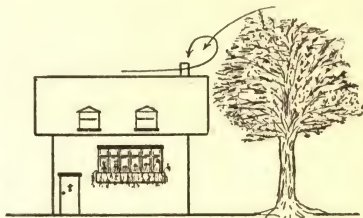


Fig. 8

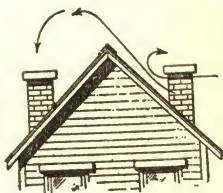


Fig. 9

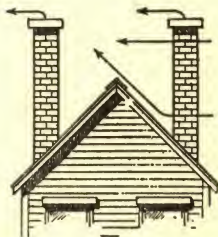


Fig. 10

Remedy for Defective Draft

FIFTH—That flue is at least eight inches in depth, and never less in area than size of smoke-pipe given by boiler manufacturer.

SIXTH—That the boiler sets as near the chimney as possible, thus shortening length of smoke-pipe, which is desirable.

SEVENTH—That the smoke-pipe does not project into chimney too far, and thus lessen the area of flue at this important point, where the smoke leaves pipe and enters flue.

For the reason that local conditions must of necessity govern the size and height of chimney, a great deal depends upon the judgment of the heating engi-

## Chimney Flues

neer, and it would be impossible to apply the same rule in every instance. Professor William Kent gives a formula which is approved by Professor R. C. Carpenter, and from which has been compiled the following table, which we believe heating engineers will find of material assistance when considering a chimney flue. This table gives the diameter of round chimneys in inches for various heights. Square chimneys with sides equal to the diameter are considered equivalent.

Height of Chimney in Feet for Surface Burning Boilers

Steam *Square Feet Rated Boiler Capacity	Water *Square Feet Rated Boiler Capacity	30	40	50	60	80	100
250	375	7.0					
500	750	9.2	8.8	8.2	8.0		
750	1,125	10.8	10.2	9.6	9.3	8.8	8.5
1,000	1,500	12.0	11.4	10.8	10.5	10.0	9.5
1,500	2,250	14.4	13.4	12.8	12.4	11.5	11.2
2,000	3,000	16.3	15.2	14.5	14.0	13.2	12.6
3,000	4,500	18.5	18.2	17.2	16.6	15.8	15.0
4,000	6,000	22.2	20.8	19.6	19.0	17.8	17.0
5,000	7,500	24.6	23.0	21.6	21.0	19.4	18.6
6,000	9,000	26.8	25.0	23.4	22.8	21.2	20.2
7,000	10,500	28.8	27.0	25.5	24.4	23.0	21.6
8,000	12,000	30.6	28.6	26.8	26.0	24.2	23.4
9,000	13,500	32.4	30.4	28.4	27.4	25.6	24.4
10,000	15,000	34.0	32.0	30.0	28.6	27.0	25.4

\*Indirect radiation should be made equivalent to direct radiation by adding 50 per cent.

## Equalization of Smoke Flues Commercial Sizes

Inside Diameter Lined Flue	Brick Flue Not Lined Well Built	Rectangular Lined Flue Outside of Tile	Outside Iron Stack
6	8½ x 8½		8
7	8½ x 8½	7 x 7	9
8	8½ x 8½	8½ x 8½	10
9	8½ x 13	8½ x 13	11
10	8½ x 13	8½ x 13	12
12	13 x 13	13 x 13	14
15	13 x 17	13 x 18	17
18	17 x 21½	18 x 18	20

Round Flue Tile Lining is listed by its inside measurement. Rectangular Lining by outside measurement.



# Chimney Flues

## New Chimneys

The ordinance for the construction of chimneys reproduced here is recommended by the National Board of Fire Underwriters. It has also been reviewed and approved by the following organizations:

American Institute of Architects.  
American Society of Heating and Ventilating Engineers.  
Associated Tile Manufacturers.  
Clay Products Association.  
Common Brick Manufacturers Association.  
Eastern Clay Products Association.  
National Boiler and Radiator Manufacturers Association.  
National Fire Protection Association.  
National Brick Manufacturers Association.  
National Lime Association—Eastern Bureau.  
National Lumber Manufacturers Association.  
National Warm Air Heating and Ventilating Association.

It furnishes a very valuable guide for the construction of chimneys which will be safe and which will assure efficient boiler operation.

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### An Ordinance Providing Minimum Requirements for Proper and Safe Construction of Chimneys, Flues and Fireplaces

#### Scope of the Ordinance

This ordinance does not apply to chimneys for high pressure boilers, furnaces used in manufacture, or for other heating appliances where high temperatures are maintained; but shall apply to all other chimneys which form a part of a building construction.

#### Section I. Chimney Construction

1. The walls of all chimneys to which this ordinance applies, whether the fuel used be wood, coal, gas or oil, shall be built of brick, concrete, stone, or hollow tile, of such thickness and construction as is hereafter specified, but this shall not preclude the use of a metal smoke-stack when located inside of a

## Chimney Flues

vent shaft having walls not less than 8 inches thick, and having an air space between the walls and stack on all sides.

2. Brick chimneys shall be built of solid brick, or may be built of perforated radial brick manufactured for the purpose and adapted to withstand high temperatures, but no other hollow brick shall be used.

3. The walls of brick chimneys shall be not less than  $3\frac{3}{4}$  inches thick (width of a standard size brick), and shall be lined with fire clay flue lining.

4. Flue lining may be omitted in brick chimneys for private dwellings, provided the walls of the chimneys are not less than 8 inches thick, and that the inner course shall be a refractory clay brick having a softening point of at least 1922 degrees Fahrenheit (Seger Cone 05).

5. Perforated radial brick chimneys may be unlined, provided the brick shall have a softening point of not less than 1994 degrees Fahrenheit (Seger Cone 03), and shall be not less than  $7\frac{1}{2}$  inches in radial thickness, except that when such chimney is located inside a vent shaft having walls not less than 8 inches thick, the thickness of the chimney wall may be determined by engineering design. The brick shall be shaped to the circular and radial lines of the various sections of the shaft so as to form even joints.

6. All brick work shall be laid in spread mortar, with all joints push-filled. Exposed joints both inside and outside shall be struck smooth. No plaster lining permitted.

7. Concrete chimneys cast in place shall be suitably reinforced vertically and horizontally. The walls shall be not less than  $3\frac{3}{4}$  inches thick and shall be lined with fire clay flue lining.

Flue linings may be omitted in reinforced concrete chimneys for private dwellings, provided the walls of the chimneys be not less than 6 inches thick, and provided further that quartz gravel shall not be used as the coarse aggregate.

Concrete blocks used in chimney construction shall have walls not less than  $3\frac{3}{4}$  inches thick, and blocks enclosing more than one flue shall have suitable rein-

## Chimney Flues

forcement completely encircling the blocks and well embedded in them. All concrete block chimneys shall have fire clay flue lining.

9. Stone chimneys shall be at least 4 inches thicker than required for corresponding brick chimneys, and shall have fire clay flue linings. Rubble stone chimney walls shall be not less than 12 inches thick.

10. Hollow building tile shall not be used for the walls of isolated or independent chimneys, but may be used for chimneys built in connection with exterior hollow tile walls of buildings not exceeding three stories in height, in which case the chimney walls shall be not less than 8 inches thick. The outer 8 inches of a building wall may serve as the outside wall of the chimney, but the remaining chimney walls shall be constructed of two layers of 4-inch tile set with broken joints; or they may be built of 4 inches of solid brickwork. In either case, the walls of the chimney shall be securely bonded into the wall of the building. No chimney shall be corbeled from a hollow tile wall. All chimneys built of hollow building tile shall have fire clay flue lining.

11. Chimneys shall be built at least 3 feet above flat roofs, and 2 feet above the ridges of peak roofs, and shall be properly capped with stone, terra cotta, concrete, cast iron, or other approved material; but no such cap or coping shall decrease the required flue area. See Plates I and II.

12. Fire clay flue linings shall be manufactured from suitable refractory clay, either natural or compounded, which has a softening point not lower than 1994 degrees Fahrenheit (Seger Cone 03), and shall be adapted to withstand high temperatures and flue gases. They shall be of standard commercial thickness, but not less than  $\frac{3}{4}$  inch. The flue sections shall be set in mortar of quality hereafter specified and shall have the joints struck smooth on the inside. The masonry shall be built around each section of lining as it is placed, and all spaces between masonry and linings shall be completely filled with mortar. No broken flue lining shall be used. Flue linings shall start at least 4 inches below the bottom of smoke pipe intakes of flues, or from the throats of fireplaces, and shall be continuous the entire heights

# Chimney Flues

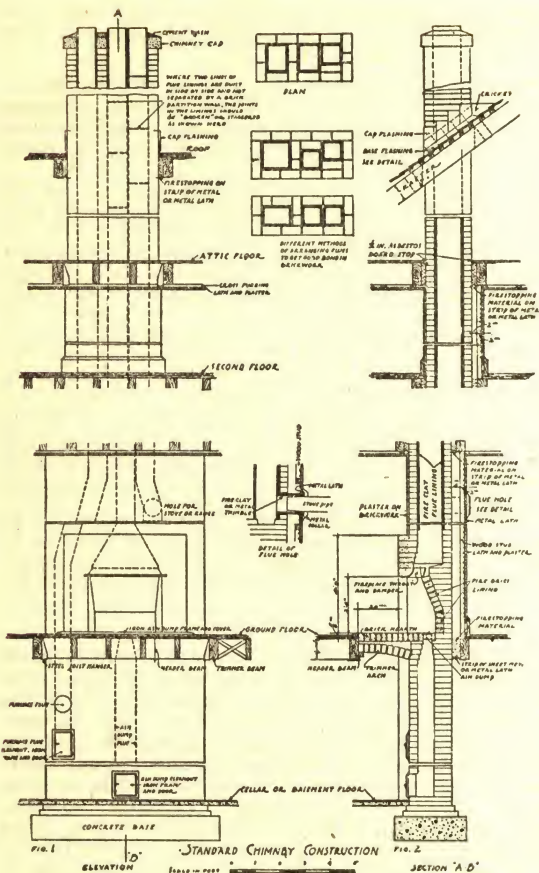


PLATE I.

Elevation and section of an interior independent chimney showing recommended construction. Extra flues can be added as desired.



## Chimney Flues

of the flues and project at least 4 inches above the chimney top to allow for a 2 inch wash and a 2 inch projection of lining. The wash or splay shall be formed of a rich cement mortar. To improve the draft the wash surface should be concave wherever practical. Instead of the wash, a special chimney cap or coping may be used. Wherever flue linings are specified fire brick may be substituted if desired.

13. Chimneys shall not rest upon or be carried by wooden floors, beams or brackets, nor be hung from wooden rafters. Iron brackets or stirrups attached to wood construction shall not be used to support chimneys. In frame buildings chimneys shall always be built from the ground up, or rest on basement walls.

14. Chimneys shall be built upon concrete or masonry foundations properly proportioned to carry the weight imposed without danger of settlement or cracking. The foundation for an exterior chimney shall start below the frost line.

15. The walls of brick buildings may form part of a chimney, but the walls of the chimney shall be securely bonded into the walls of the building, and the flue shall be lined the same as an independent chimney. Flues in party walls shall not extend beyond the center of the walls, and their location shall be permanently indicated on the exposed side of the wall.

16. No wall less than 12 inches thick shall be used to support a corbeled chimney; such corbeling shall not project more than 6 inches from the face of the wall, and in all such cases the corbeling shall consist of at least five courses of brick.

17. Flues shall be built as nearly vertical as possible, but in no case shall they have an angle greater than 45 degrees from the vertical. Where flues change direction, the abutting linings at the angle joints shall be chipped to fit closely, and at no point shall the cross section area be reduced. There shall be but one connection to a flue.

18. Not more than two flues shall be permitted in the same flue space, and the joints of any two adjoining sets of flue linings shall be offset at least 7 inches. When there are more than two flues in a chimney, at least each third flue shall be separated



## Chimney Flues

from the others by a smoke-tight withe or division wall of brick or concrete at least  $3\frac{3}{4}$  inches thick and bonded into the sidewalls. Each flue intended for a heating furnace or boiler connection, or for a fire-

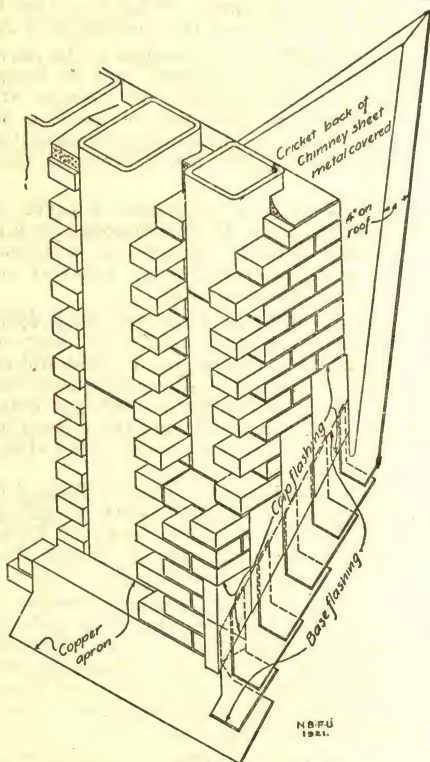


PLATE II.

Details of chimney construction showing method of flashing at roof surface, also a wash course, but no cap surrounding flues at top. See Plate I.

## Chimney Flues

place, shall be separated from other flues by such a withe. In hollow tile chimneys the withe may be of tile.

19. When any single flue area within chimney walls exceed 200 square inches, the walls shall be built not less than 8 inches thick and shall have fire clay flue lining as previously specified, but when flues become so large as to render it impractical to secure fire clay flue lining, they shall be lined with fire brick for a distance of at least 25 feet from the point of intake. Fire brick shall be laid in fire clay mortar.

20. Connections between chimneys and roofs shall be made with sheet metal counter or cap flashing (copper recommended), arranged to overlap roof flashing and allow for movement that may occur between chimneys and roofs. See Plates I and II.

21. No increase in the wall thickness of chimneys, nor any projecting masonry, shall be permitted within a distance of 12 inches above or below the rafters or roof joists.

22. Irrespective of whether the fuel used be coal, coke, wood or oil, the minimum area inside of chimney flue linings for various heating devices shall be as follows: For warm air furnaces, or low pressure steam or hot water heating boilers, not less than 75 square inches; for fireplaces, not less than one-tenth the area of the fireplace opening, but never less than 75 square inches; for stoves, ranges, and other forms of room heaters, 49 square inches for rectangular flues, or an inside diameter of 7 inches for round flues. In no case shall the short cross section dimension of a rectangular flue be less than two-thirds the greater dimension.

When gas is the fuel used in a heating furnace, boiler, or automatic hot water heater, the flues shall be of the same size and construction as required for stoves and ranges using other fuel. Vent flues where required for other domestic gas burning appliances may be of smaller size, but not less than 10 square inches. Such flues shall be made of fire clay or its equivalent not less than 1 inch thick with joints properly designed to effect a permanent seal, and the surrounding masonry wall may be omitted. Metal vent flues are not permitted.

# Chimney Flues

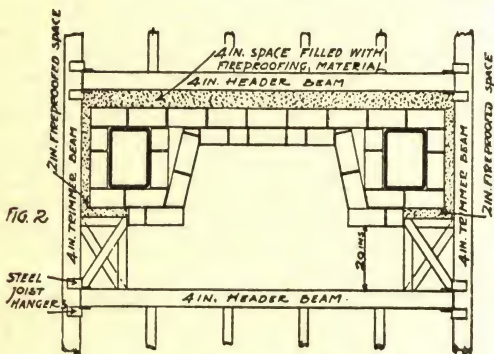
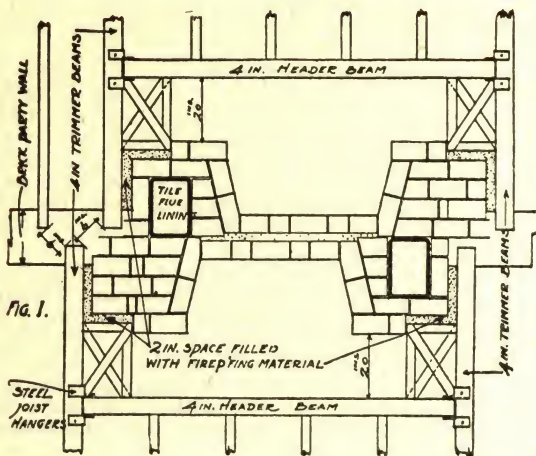


PLATE III.

Fig. 1.—Method for building two fireplaces back-to-back in a brick party wall to secure proper spacing between ends of floor joists.

Fig. 2.—Floor framing around a single fireplace. Note filling between framing and brickwork, which serves both as insulator and fire-stop.

## Chimney Flues

23. Smokepipe intakes to flues shall always enter the chimney through the side and shall consist of fire clay or metal thimbles securely set in the chimney wall with mortar, or the intake may be cast in concrete. Such openings shall be at least 18 inches below wooden lath and plaster or other combustible ceilings, or open joists. Neither the intake pipe nor thimble shall project into the flue. No woodwork shall be placed within 6 inches of the thimble. The thimble shall be surrounded by metal lath and plaster for a space of at least 6 inches, or an open space of that width shall be provided on all sides. See detail sketch Plate 1.

24. All mortar used in chimney construction, except as specified for fire brick in paragraph 19, shall be cement mortar proportioned as follows: Two bags of Portland cement, not less than 188 pounds, and one bag of dry hydrated lime, 50 pounds, thoroughly mixed dry. To this mixture shall be added three times its volume of clean, sharp sand with sufficient water to produce proper consistency. When dry hydrated lime is not available, 1 cubic foot of completely slaked lime putty may be substituted for 50 pounds of dry hydrate. In case of such substitution, the mixing of lime and cement shall be very thorough. Dry hydrate should always be used in preference to lime putty.

25. After a chimney has been completed, all flues shall be thoroughly cleaned and left smooth on the inside.

26. All flues to which heating furnaces or boilers are to be connected shall be subjected to a smoke test before acceptance, but the test shall not be made until the mortar has thoroughly hardened. The method of test is to build a smudge fire at bottom of the flue and while the smoke is flowing freely from the flue, close it tightly at the top. Escape of smoke into other flues or through the chimney walls indicates openings that shall be made tight before the chimney is accepted. The test shall be made by the contractor in the presence of the building inspector or other official having jurisdiction, and of the owner or his representative.

### Section II. Woodwork Around Chimneys

1. No wooden beams, joints, or rafters shall be placed within 2 inches of the outside face of chim-



# Chimney Flues

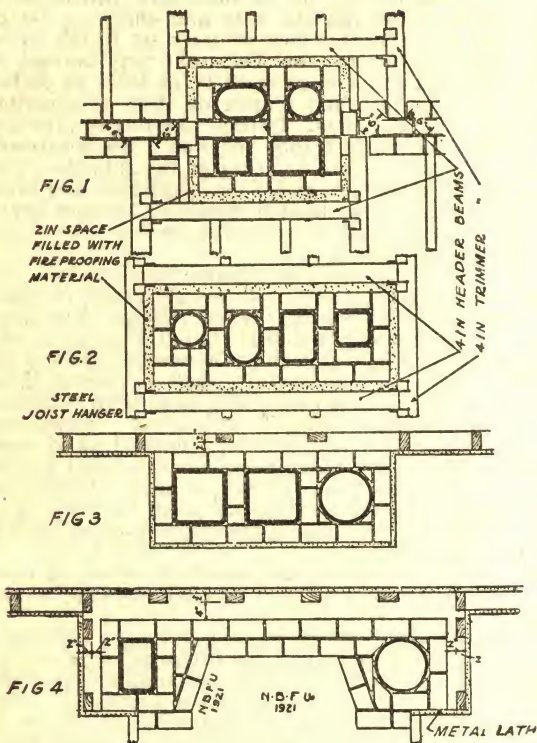


PLATE IV

Fig. 1.—Floor framing around chimney in a party wall, to secure proper space between ends of floor joists.

Fig. 2.—Ordinary floor framing around a chimney.—All timbers 2 inches clear of brickwork and space filled with fire-proofing material.

Fig. 3.—Stud partition across back of a chimney showing proper method of arranging studs.

Fig. 4.—Stud partition across back of a fireplace and around the ends of the chimney breast, showing proper arrangement of studs. Method of fire-stopping this space is shown on chimney section, Plate I, also in Fig. 2, Plate III.



## Chimney Flues

neys, whether the same be for smoke, air or any other purpose. No woodwork shall be placed within 4 inches of the back wall of any fireplace. See Plate III, Fig. 2, and Plate IV, Fig. 4.

2. All spaces between chimneys and wooden joists or beams shall be filled with loose cinders, loose mortar refuse, gypsum block, or other porous incombustible material to form a firestop. See Plates I, III and IV.

The incombustible material shall be supported by strips of sheet metal or metal lath set into the brickwork and nailed to the wooden beams, forming a buckled flexible joint between, as indicated in Plate 1; or by similar strips of metal nailed to the woodwork with the inner edge close to the chimney. See Plate V.

3. No wooden studding, furring, lathing, or plugging shall be placed against any chimney, or in the joints thereof. Wooden construction shall either be set away from the chimneys, or the plastering shall be directly on the masonry or on metal lathing or on incombustible furring material. Wood furring strips placed around chimneys to support base or other trim shall be insulated from the masonry by asbestos paper, at least  $\frac{1}{8}$ -inch thick, and metal wall plugs or approved incombustible nail holding devices attached to the wall surface shall be used for nailing. See Plate V.

4. The walls of fireplaces shall never be less than 8 inches thick, and if built of stone the minimum thickness shall be 12 inches.

5. All fireplaces and chimney breasts shall have trimmer arches or other approved fire-resistive construction supporting hearths. The arches and hearths shall be at least 20 inches wide, measured from the face of the chimney breast. The arches shall be of brick, stone or hollow tile, not less than 4 inches thick. A flat stone or a reinforced concrete slab may be used to carry the hearth instead of an arch if it be properly supported and a suitable fill be provided between it and the hearth. The length of trimmer arches and hearths shall be not less than 24 inches longer than the fireplace opening. Hearths shall be of brick, stone, tile, or concrete as may be specified. Wood centering under a trimmer arch shall be removed before plastering the ceilings beneath.

## Chimney Flues

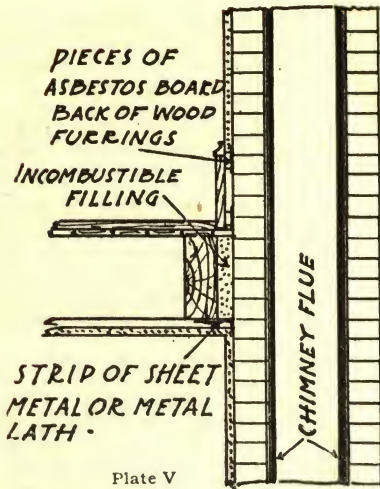


Plate V

Detail showing support for fire-stopping around chimney, and protection for woodwork placed next to plaster on chimney brickwork.

6. No coal burning heater shall be placed in a fireplace which does not conform to the foregoing requirements and have an incombustible mantel.

7. No wooden mantel or other woodwork shall be placed within 8 inches of the side or within 12 inches of the top of any open fireplace. No combustible summer piece or fire board shall be used.

8. Any person or persons, whether owner, builder or mechanic; who shall build a chimney or flue in violation of any requirement of this ordinance shall be deemed guilty of a misdemeanor and shall be fined not less than \$10 nor more than \$..... for each offense; and any chimney or flue which is built in violation of any requirement of this ordinance shall be immediately demolished or rebuilt. It shall be the duty of the building inspector or other duly authorized official to enforce this ordinance.

9. All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed.

# MINIMUM CHIMNEY FLUE SIZES AND HEIGHTS RECOMMENDED FOR LOW PRESSURE STEAM AND HOT WATER BOILERS

Area dimensions given are inside measurements of the masonry walls of the chimney

Boiler Capacity		NUMBER OF BOILERS ATTACHED TO FLUE							
Hot Water Rating Sq. Ft.	Steam (Direct) Rating Sq. Ft.	1		2		3		4	
		Dimensions Inches	Height Feet	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet
To 700 900 1100 1500 2500 4000 5800 7300 8700 10000 12000 14000 15000 17000 19000	To 450 600 700 1000 1500 2500 3600 4500 5400 6400 7400 8400 9400 10400 11400	8x12	35	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet	Dimensions Inches	Height Feet
		8x12	35	12x16	45	16x20	50	20x20	55
		8x12	40	16x20	50	20x24	55	24x24	60
		12x12	35	20x24	55	24x28	60	28x28	65
		12x12	40	24x24	60	28x32	65	30x30	70
		12x16	40	24x28	65	30x30	70	30x36	80
		16x16	45	28x28	70	30x32	80	30x36	90
		16x20	50	30x30	75	32x32	85	36x36	90
		20x20	55	32x32	85	36x36	90	42x42	100
		20x24	60	36x36	90	42x42	90	48x48	100
		24x24	65	42x42	90				
		24x28	70						
		28x28	70						
		28x32	70						
		30x30	70						

Where round tile flue lining is used in place of rectangular, the nearest corresponding area shall be taken.

## How to Order Repair Parts

Care must be exercised when ordering repairs as changes in construction are continually being made, and to avoid misunderstandings and errors in filling orders for repair parts, it is essential that careful attention be given.

Attention is especially directed to the three styles of bases for round boilers. The "B" base (shown on page 289). The triangular base (shown on page 293), and the improved triangular base shown on page 295 the present style.

A list of repairs will be found on the following pages.

**1st. Give correct name and number.**

It is advisable in all cases to use the given name to repairs as well as any numbers that may be cast upon them.

**2nd. Always mention style of casting.**

Always refer to casting containing waterways as "cored castings", and all others as "plain".

**3rd. Wherever possible send rough sketch.**

Oftentimes a rough penciled sketch of the part desired, sent with order, will avoid complications.

**4th. Sections for sectional boiler.**

Sections for square boilers may be designated as No. 1 the front section and No. 2 the next to front, etc.

**5th. Sections for Down Draft Boilers.**

Sections are designated as R. H. end sect.; L. H. end sect.; Intermediate sect. with outlet tappings; Intermediate sect. without outlet tappings; single water front sect. for sizes up to and including No. 847; R. H. or L. H. water front sect. for sizes larger than No. 847; Give serial number of boiler if possible.

**6th. Sections for round boilers.**

Sections for round boilers are called firepot, 1st section over firepot, 2nd section over firepot, etc., according to their position in boiler.

**7th. Doors and door frames.**

Show by sketch where doors are to be located, giving dimensions.

**8th. Give full name.**

On all orders make sure that the numbers and name in full, which appear on the name plate, are given.

**9th. How shipped.**

Specify as to whether freight or express shipment is expected



## Price List Repairs

### 21 Series Pierce American Boiler

ARTICLE	213	214	215	216	217
Front Base Panel.....	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00	\$ 9.00
Base Panel, R. or L.....	17.80	24.00	29.40	34.80	46.00
Base Panel Rear.....	8.00	8.00	8.00	8.00	8.00
Ashpit Door.....	3.00	3.00	3.00	3.00	3.00
Ashpit Lift Door.....	1.88	1.88	1.88	1.88	1.88
Base Cleanout Door, Rear..	1.50	1.50	1.50	1.50	1.50
Door Handles and Latches ..	.75	.75	.75	.75	.75
Clinker Door.....	1.75	1.75	1.75	1.75	1.75
Clinker Door Liner.....	.75	.75	.75	.75	.75
Coil Plate.....	.75	.75	.75	.75	.75
Coil Plate Cleat.....	.50	.50	.50	.50	.50
Fire Door.....	4.50	4.50	4.50	4.50	4.50
Fire Door Liner.....	2.25	2.25	2.25	2.25	2.25
Fire Door Slide.....	.75	.75	.75	.75	.75
Finger Bar.....	4.00	4.00	4.00	4.00	4.00
Grate Bar, Front or Rear...	6.90	6.90	6.90	6.90	6.90
Grate Bar, Middle.....	7.20	7.20	7.20	7.20	7.20
Grate Connecting Bar, Long	2.20	2.20	3.00	3.60	5.00
Grate Connecting Bar Short	1.10	1 10	1 70	1.70	3.00
Grate Connecting Bar Shield.....	.50	.50	.50	.50	.50
Grate Connecting Bar Slide.....	.35	.35	.35	.35	.35
Grate Lug.....	.75	.75	.75	.75	.75
Shaker Handle.....	2.25	2.25	2.25	2.25	2.25
Shaker Fulcrum.....	3.75	3.75	3.75	3.75	3.75
Shaker Arm.....	1.50	1.50	1.50	1.50	1.50
Front Plate, old style.....	27.38	27.38	27.38	27.38	27.38
Front Plate C. O. Door, R. or L.....	2.50	2.50	2.50	2.50	2.50
Cleanout Door Liner.....	.88	.88	.88	.88	.88
Flue Strips, long or short...	.50	.50	.50	.50	.50
Smoke Hood.....	10.00	10.00	10.00	10.00	10.00
Smoke Hood Collar.....	1.88	1.88	1.88	1.88	1.88
Smoke Hood Square Damper.....	2.25	2.25	2.25	2.25	2.25
Square Damper Quadrant..	.75	.75	.75	.75	.75
Square Damper Quadrant Stem.....	.75	.75	.75	.75	.75
Square Damper Nut and Thumbscrew.....	.50	.50	.50	.50	.50
Smoke Box Check Door....	.88	.88	.88	.88	.88
Smoke Box Check Door Frame.....	1.63	1.63	1.63	1.63	1.63
Manifold Top.....	23.00	30.00	34.00	39.00	48.00
Manifold, Right or Left....	14.00	16.00	19.00	24.00	30.00
Manifold Nipple, 2 x 4½...	2.00	2.00	2.00	2.00	2.00
Front Water Section.....	59.00	59.00	59.00	59.00	59.00
Rear Water Section.....	75.50	75.50	75.50	75.50	75.50
Firebox Section.....	60.00	60.00	60.00	60.00	60.00
Number Plate.....	.75	.75	.75	.75	.75
Pea Coal Gate, front and rear.....	8.70	8.70	8.70	8.70	8.70
Pea Coal Gate Middle.....	9.00	9.00	9.00	9.00	9.00
Base Panel, 1 Section.....	5.70	5.70	5.70	5.70	5.70
Base Panel, 2 Section.....	12.00	12.00	12.00	12.00	12.00
Base Panel, 3 Section.....	18.00	18.00	18.00	18.00	18.00
Base Panel, 4 Section.....	21.00	21.00	21.00	21.00	21.00
Short Shaker Stop, R. or L.	.75	.75	.75	.75	.75

For price on Fire Tools and Steam Trimmings, see Fire Tools and Steam Trimmings list.



# Price List Repairs

## 26 Series Pierce American Boiler

ARTICLE	264	265	266	267	268
Front Base Panel.....	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
Base Panel, R. or L.....	24.00	29.40	34.80	46.00	52.00
Base Panel Rear.....	10.50	10.50	10.50	10.50	10.50
Ashpit Door.....	4.00	4.00	4.00	4.00	4.00
Ashpit Lift Door.....	1.88	1.88	1.88	1.88	1.88
Base C. O. Door, Rear...	1.50	1.50	1.50	1.50	1.50
Door Handles and Latches	.75	.75	.75	.75	.75
Clinker Door.....	1.88	1.88	1.88	1.88	1.88
Clinker Door Liner.....	.75	.75	.75	.75	.75
Coil Plate.....	.75	.75	.75	.75	.75
Coil Plate Cleat.....	.50	.50	.50	.50	.50
Fire Door.....	5.75	5.75	5.75	5.75	5.75
Fire Door Liner.....	3.00	3.00	3.00	3.00	3.00
Fire Door Slide.....	.75	.75	.75	.75	.75
Finger Grate Bar.....	5.00	5.00	5.00	5.00	5.00
Grate Bar, Front or Rear					
.....	9.50	9.50	9.50	9.50	9.50
Grate Bar Middle.....	9.80	9.80	9.80	9.80	9.80
Grate Connect'g Bar Long	3.40	3.80	4.50	5.10	5.90
Grate Connect'g Bar Short	2.00	2.00	2.00	3.00	3.00
Grate Connecting Bar					
Shield.....	.50	.50	.50	.50	.50
Grate Connecting Bar					
Slide.....	.35	.35	.35	.35	.35
Grate Lug.....	.75	.75	.75	.75	.75
Shaker Handle.....	3.00	3.00	3.00	3.00	3.00
Shaker Fulcrum.....	3.75	3.75	3.75	3.75	3.75
Shaker Arm.....	2.00	2.00	2.00	2.00	2.00
Front Plate, Old Style...	32.13	32.13	32.13	32.13	32.13
Front Plate C. O. Door,					
R. or L.....	2.80	2.80	2.80	2.80	2.80
Cleanout Door Liner....	1.00	1.00	1.00	1.00	1.00
Flue Strips, long or short.	.50	.50	.50	.50	.50
Smoke Hood.....	11.00	11.00	11.00	11.00	11.00
Smoke Hood Collar.....	2.13	2.13	2.13	2.13	2.13
Smoke Hood Slide Damper	2.75	2.75	2.75	2.75	2.75
Smoke Hood Slide Damper					
Strip.....	.75	.75	.75	.75	.75
Square Damper.....	2.50	2.50	2.50	2.50	2.50
Square Damper Quadrant	.75	.75	.75	.75	.75
Square Damper Quadrant					
stem.....	.75	.75	.75	.75	.75
Square Damper Nut and					
Thumbscrew.....	.50	.50	.50	.50	.50
Smoke Box Check Door..	1.00	1.00	1.00	1.00	1.00
Smoke Box Check Door					
Frame.....	1.80	1.80	1.80	1.80	1.80
Manifold Top.....	32.00	36.00	40.00	48.00	50.00
Manifold, Right or Left..	20.00	21.00	22.50	27.00	30.00
Manifold Nipple Top,					
2 1/2 x 5.....	2.50	2.50	2.50	2.50	2.00
Manifold Nipple Side,					
2 x 4 1/2.....	2.00	2.00	2.00	2.00	2.05
Manifold Flanges.....	5.00	5.00	5.00	5.00	5.00
Front Water Section....	80.00	80.00	80.00	80.00	80.00
Rear Water Section.....	95.00	95.00	95.00	95.00	95.00
Firebox Section.....	86.50	86.50	86.50	86.50	86.50
Long Legged Section....	78.00	78.00	78.00	78.00	78.00
Pea Coal Grate, front and					
rear.....	9.50	9.50	9.50	9.50	9.50
Pea Coal Grate, middle..	10.50	10.50	10.50	10.50	10.50

# Price List Repairs

## 26 Series Pierce American Boiler

(Continued)

ARTICLE	264	265	266	267	268
Base Panel, 1 Section....	\$5.70	\$5.70	\$5.70	\$5.70	\$5.70
Base Panel, 2 Section....	12.00	12.00	12.00	12.00	12.00
Base Panel, 3 Section....	18.00	18.00	18.00	18.00	18.00
Base Panel, 4 Section....	21.00	21.00	21.00	21.00	21.00
Blank Grate, front and rear.....	5.00	5.00	5.00	5.00	5.00
Blank Grate, middle....	9.00	9.00	9.00	9.00	9.00
Short Shaker Stop, R....	.75	.75	.75	.75	.75
Short Shaker Stop, L....	.75	.75	.75	.75	.75
The following used in place of front plate:					
Front C. O. Door Frame, new style.....	6.00	6.00	6.00	6.00	6.00
Front Fire Door Frame, new style.....	4.50	4.50	4.50	4.50	4.50
Front Clinker Door Frame, new style.....	6.50	6.50	6.50	6.50	6.50

For price on Steam Trimmings and Fire Tools, see Steam Trimmings and Fire Tool list.

# Price List Repairs—32 Series Pierce American Boiler

## ARTICLE

	325	326	327	328	329	3210
Front Base Panel.....	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00
Base Panel, R. or L.....	29.40	34.80	46.00	52.00	54.00	58.50
Base Panel, Rear.....	13.00	13.00	13.00	13.00	13.00	13.00
Base Side Finger Piece.....	.....	.....	.....	.....	.....	.60
Aspfit Door.....	4.25	4.25	4.25	4.25	4.25	4.25
Aspfit Lift Door.....	1.88	1.88	1.88	1.88	1.88	1.88
Base Cleanout Door, Rear.....	1.50	1.50	1.50	1.50	1.50	1.50
Door Handles and Latches.....	.75	.75	.75	.75	.75	.75
Clinker Door.....	1.88	1.88	1.88	1.88	1.88	1.88
Clinker Door Liner.....	.75	.75	.75	.75	.75	.75
Coil Plate.....	.75	.75	.75	.75	.75	.75
Coil Plate Cleat.....	.50	.50	.50	.50	.50	.50
Fire Door.....	5.75	5.75	5.75	5.75	5.75	5.75
Fire Door Liner.....	3.00	3.00	3.00	3.00	3.00	3.00
Fire Door Slide.....	.75	.75	.75	.75	.75	.75
Finger Bar.....	6.00	6.00	6.00	6.00	6.00	6.00
Grate Bar, Front or Rear.....	10.25	10.25	10.25	10.25	10.25	10.25
Grate Bar, Middle.....	11.50	11.50	11.50	11.50	11.50	11.50
Grate Connecting Bar, Long.....	2.60	3.10	3.70	4.20	4.80	5.40
Grate Connecting Bar, Short.....	2.00	2.50	3.00	3.75	4.40	4.90
Grate Connecting Bar Shield.....	.60	.60	.60	.60	.60	.60
Grate Connecting Bar Slide.....	.35	.35	.35	.35	.35	.35
Grate Lug.....	.75	.75	.75	.75	.75	.75
Shaker Handle.....	3.00	3.00	3.00	3.00	3.00	3.00
Shaker Fulcrum.....	2.50	2.50	2.50	2.50	2.50	2.50
Shaker Arm.....	2.00	2.00	2.00	2.00	2.00	2.00
Shaker Arm Connecting Bar.....	1.75	1.75	1.75	1.75	1.75	1.75
Front Plate, old style.....	40.00	40.00	40.00	40.00	40.00	40.00
Front Plate C. O. Doors, R. or L.....	3.75	3.75	3.75	3.75	3.75	3.75
Cleanout Door Liner.....	2.00	2.00	2.00	2.00	2.00	2.00
Cleanout Door Flue Strip.....	1.00	1.00	1.00	1.00	1.00	1.00
Flue Strip, long or short.....	.50	.50	.50	.50	.50	.50

# Price List Repairs—32 Series Pierce American Boiler (Continued)

ARTICLE	325	326	327	328	329	3210
Smoke Hood.....	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00	\$12.00
Smoke Hood Collar.....	2.50	2.50	2.50	2.50	2.50	2.50
Smoke Hood Slide Damper.....	3.30	3.30	3.30	3.30	3.30	3.30
Smoke Hood Slide Damper Strip.....	.75	.75	.75	.75	.75	.75
Square Damper.....	2.65	2.65	2.65	2.65	2.65	2.65
Square Damper Quadrant.....	.75	.75	.75	.75	.75	.75
Square Damper Quadrant Stem.....	.75	.75	.75	.75	.75	.75
Square Damper Nut and Thumbscrew.....	.50	.50	.50	.50	.50	.50
Smoke Box Check Door.....	1.00	1.00	1.00	1.00	1.00	1.00
Smoke Box Check Door Frame.....	1.80	1.80	1.80	1.80	1.80	1.80
Manifold Top.....	44.00	52.00	61.00	70.00	75.00	78.00
Manifold, R. or L.....	26.00	30.00	34.50	39.00	41.00	45.00
Manifold Nipples, 2½ x 5.....	2.50	2.50	2.50	2.50	2.50	2.50
Manifold Flanges.....	6.00	6.00	6.00	6.00	6.00	6.00
Front Water Section.....	102.50	102.50	102.50	102.50	102.50	102.50
Rear Water Section.....	136.50	136.50	136.50	136.50	136.50	136.50
Firebox Section.....	98.00	98.00	98.00	98.00	98.00	98.00
Firebox Section, rear.....	.....	.....	95.00	95.00	95.00	95.00
Number Plate.....	.75	.75	.75	.75	.75	.75
Pea Coal Grate, front or rear.....	12.40	12.40	12.40	12.40	12.40	12.40
Pea Coal Grate Center.....	13.40	13.40	13.40	13.40	13.40	13.40
Blank Flange.....	7.00	7.00	7.00	7.00	7.00	7.00
Base Panel, 1 Section.....	5.70	5.70	5.70	5.70	5.70	5.70
Base Panel, 2 Section.....	12.00	12.00	12.00	12.00	12.00	12.00
Base Panel, 3 Section.....	18.00	18.00	18.00	18.00	18.00	18.00
Base Panel, 4 Section.....	21.00	21.00	21.00	21.00	21.00	21.00
Blank Grate, front or rear.....	6.00	6.00	6.00	6.00	6.00	6.00
Blank Grate Center.....	10.00	10.00	10.00	10.00	10.00	10.00
Short Shaker Stop, R.....	.75	.75	.75	.75	.75	.75
Short Shaker Stop, L.....	.75	.75	.75	.75	.75	.75

For price list on Steam Trimmings and Fire Tools, see Steam Trimming and Fire Tool List.

# Price List Repairs—40 Series Pierce American Boiler

## ARTICLE

	405	406	407	408	409	4010	4011
Front Base Panel.....	\$15.20	\$15.20	\$15.20	\$15.20	\$15.20	\$15.20	\$15.20
Base Panel, R. or L.....	29.40	34.80	34.80	52.00	54.00	58.50	64.00
Base Panel Rear.....	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Base Side Finger Piece.....	...	...	...	...	.60	.60	.60
Asphalt Door.....	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Asphalt Lift Door.....	2.12	2.12	2.12	2.12	2.12	2.12	2.12
Base C. O. Door, rear.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Door Handles and Latches.....	.75	.75	.75	.75	.75	.75	.75
Clinker Door.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Clinker Door Liner.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coil Plate.....	.75	.75	.75	.75	.75	.75	.75
Coil Plate Cleat.....	.50	.50	.50	.50	.50	.50	.50
Fire Door.....	6.25	6.25	6.25	6.25	6.25	6.25	6.25
Fire Door Liner.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Fire Door Slide.....	.75	.75	.75	.75	.75	.75	.75
Finger Bar.....	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Grate Bar, Front or Rear.....	13.30	13.30	13.30	13.30	13.30	13.30	13.30
Grate Bar Middle.....	14.20	14.20	14.20	14.20	14.20	14.20	14.20
Grate Connecting Bar, Short.....	2.00	2.50	3.00	3.75	4.40	4.90	5.40
Grate Connecting Bar, Long.....	2.60	3.10	3.70	4.20	4.80	5.40	6.00
Grate Connecting Bar Shield.....	.60	.60	.60	.60	.60	.60	.60
Grate Connecting Bar Slide.....	.35	.35	.35	.35	.35	.35	.35
Grate Lug.....	.75	.75	.75	.75	.75	.75	.75
Shaker Handle.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Shaker Fulcrum.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Shaker Arm.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Shaker Arm Connecting Bar.....	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Front Plate.....	46.50	46.50	46.50	46.50	46.50	46.50	46.50
C. O. Door, R. or L.....	5.30	5.30	5.30	5.30	5.30	5.30	5.30
C. O. Door Liner.....	3.50	3.50	3.50	3.50	3.50	3.50	3.50
C. O. Door Flue Plate.....	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Flue Strips, long or short.....	.50	.50	.50	.50	.50	.50	.50



# Price List Repairs—40 Series Pierce American Boiler (Continued)

## ARTICLE

	405	406	407	408	409	4010	4011
Smoke Hood.....	\$13.00	\$13.00	\$13.00	\$13.00	\$13.00	\$13.00	\$13.00
Smoke Collar.....	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Smoke Hood Slide Damper.....	3.20	3.20	3.20	3.20	3.20	3.20	3.20
Smoke Hood Strip.....	.75	.75	.75	.75	.75	.75	.75
Square Damper.....	3.65	3.65	3.65	3.65	3.65	3.65	3.65
Square Damper Quadrant.....	.75	.75	.75	.75	.75	.75	.75
Square Damper Nut and Thumbscrew.....	.50	.50	.50	.50	.50	.50	.50
Smoke Box Check Door.....	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Smoke Box Check Door Frame.....	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Manifold Top.....	44.00	52.00	61.00	70.00	75.00	78.00	90.00
Manifold, R. or L.....	26.00	30.00	34.50	39.00	41.00	45.00	47.50
Manifold Nipple, 2½ x 5.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Manifold Flanges.....	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Front Water Section.....	127.50	127.50	127.50	127.50	127.50	127.50	127.50
Rear Water Section.....	162.00	162.00	162.00	162.00	162.00	162.00	162.00
Firebox Section.....	117.00	117.00	117.00	117.00	117.00	117.00	117.00
Firebox Section, Rear.....	112.00	112.00	112.00	112.00	112.00	112.00	112.00
Number Plate.....	.75	.75	.75	.75	.75	.75	.75
Pea Coal Grate, front or rear.....	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Pea Coal Grate Center.....	17.75	17.75	17.75	17.75	17.75	17.75	17.75
Blank Flange.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00
Base Panel, 1 Section.....	5.70	5.70	5.70	5.70	5.70	5.70	5.70
Base Panel, 2 Section.....	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Base Panel, 3 Section.....	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Base Panel, 4 Section.....	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Blank Grate, rear or front.....	6.50	6.50	6.50	6.50	6.50	6.50	6.50
Blank Grate Center.....	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Short Shaker Stop, R.....	.75	.75	.75	.75	.75	.75	.75
Short Shaker Stop, L.....	.75	.75	.75	.75	.75	.75	.75

For price on Steam Trimmings and Fire Tools, see Steam Trimming and Fire Tool list

# Price List Repairs—46 Series Pierce American Boiler

## ARTICLE

Base Front.....	901	903	905	907	909	911	913	
Base Front Door, R. and L.....	902	904	906	908	910	912	914	
Base Front Door Rod Damper.....	466	467	468	469	4610	4611	4612	4613
Base Side, Right.....	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00
Base Side, Left.....	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Base Side Draft Door Frame.....	.75	.75	.75	.75	.75	.75	.75	.75
Base Side Draft Door.....	28.00	37.00	40.00	50.50	57.00	60.00	62.00	70.00
Base Side Finger Piece, R. and L.....	30.00	30.00	42.00	52.50	60.00	64.00	66.00	75.00
Base Back.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Base Back C. O. Door, R. and L.....	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Clinker Door Liner.....	.80	.80	.80	.80	.80	.80	.80	.80
Fire Door, Right.....	28.50	28.50	28.50	28.50	28.50	28.50	28.50	28.50
Fire Door, Left.....	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Fire Door Liner.....	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Fire Door Rod Damper.....	.75	.75	.75	.75	.75	.75	.75	.75
Fulcrum.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Flue Strips, Long.....	.50	.50	.50	.50	.50	.50	.50	.50
Flue Strips, Short.....	.40	.40	.40	.40	.40	.40	.40	.40
Finger Bar.....	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60
Flanges.....	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Front Plate, Upper.....	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00
Front Plate, Lower.....	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
Front Plate Lower C. O. Door, R. and L.....	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Front Plate Lower C. O. Door Liner.....	.75	.75	.75	.75	.75	.75	.75	.75
Front Plate Upper C. O. Door, R. and L.....	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Front Plate Upper C. O. Door Liner.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Grate End with Lug.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
Grate Center with Lug.....	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

# Price List Repairs—46 Series Pierce American Boiler (Continued)

## ARTICLE

Grate Lug.....	901	903	905	907	909	911	913	
Grate Rest.....	\$ .75	\$ .75	\$ .75	\$ .75	\$ .75	\$ .75	\$ .75	
Grate Connecting Bar, Patch.....	20.00	23.50	26.50	33.25	37.00	40.00	44.00	
Grate Connecting Bar Shield.....	3.60	4.25	5.00	5.75	6.50	7.25	8.00	
Grate Connecting Bar Slide.....	.75	.75	.75	.75	.75	.75	.75	
Header Top.....	.50	.50	.50	.50	.50	.50	.50	
Header Side, R. or L.....	75.00	86.70	96.00	102.00	120.00	130.00	134.00	
Nipples and Locknuts, Side, 2½ x 7½.....	34.25	37.00	43.00	47.00	54.50	61.00	62.00	
Nipples and Locknuts, Top, 3 x 5½.....	2.75	2.75	2.75	2.75	2.75	2.75	2.75	
Section, Front.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	
Section, Rear.....	212.00	212.00	212.00	212.00	212.00	212.00	212.00	
Section, Firebox.....	291.00	291.00	291.00	291.00	291.00	291.00	291.00	
Section, Rear Firebox.....	234.00	234.00	234.00	234.00	234.00	234.00	234.00	
	216.00	216.00	216.00	216.00	216.00	216.00	216.00	
Smoke Hood.....	28.00	28.00	28.00	28.00	28.00	28.00	28.00	
Smoke Hood Collar, 18".....	5.50	5.50	5.50	5.50	5.50	5.50	5.50	
Smoke Hood Collar, 20".....	.....	.....	.....	.....	.....	.....	.....	
Smoke Hood Round Dampers, 20".....	.....	.....	.....	.....	.....	.....	.....	
Smoke Hood Round Dampers, 18".....	4.70	4.70	4.70	4.70	4.70	4.70	4.70	
Smoke Hood Square Dampers.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	
Smoke Hood C. O. Door Frame.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Smoke Pipe Draft Door..	.75	.75	.75	.75	.75	.75	.75	
Smoke Pipe Draft Door Frame.....	1.70	1.70	1.70	1.70	1.70	1.70	1.70	
	2.65	2.65	2.65	2.65	2.65	2.65	2.65	

For all  
900 Boilers,  
Old Style

# Price List Repairs—46 Series Pierce American Boiler (Continued)

## ARTICLE

Shaker Lever or Handle.....	901	903	905	907	909	911	913
Short Shaker.....	902	904	906	908	910	912	914
Short Shaker Connecting Bar.....	466	467	468	469	4610	4611	4612
Name Plate.....	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50
Number Plate.....	2.25	2.25	2.25	2.25	2.25	2.25	2.25
Pea Coal Grate, Front and Rear.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Pea Coal Grate, Center.....	5.00	5.00	5.00	5.00	5.00	5.00	5.00
All Door Handles.....	.75	.75	.75	.75	.75	.75	.75
Base Side Connection.....	8.20	8.20	8.20	8.20	8.20	8.20	8.20
Grate Rest Support, Top.....	9.80	9.80	9.80	9.80	9.80	9.80	9.80
Grate Rest Support, Bottom.....	.75	.75	.75	.75	.75	.75	.75
Price on Fire Tools, see Fire Tool list.	....	....	....	....	1.75	1.75	1.75
Price on Steam Trimmings, see Steam Trimming list.	....	....	1.50	1.50	1.50	1.50	1.50
	....	....	1.50	1.50	1.50	1.50	1.50

Smoke Box.....	\$30.00
Smoke Box Collar, 20".....	3.00
Smoke Box Check Door Frame.....	4.00
Smoke Box Check Door.....	2.75
Smoke Box Square Damper.....	6.00
Smoke Box Double Damper, R.....	3.00
Smoke Box Double Damper, L.....	4.00
Smoke Box Double Damper Connection.....	.75
Smoke Box Square Damper Stem.....	.50
Smoke Box Square Damper Quadrant.....	.50
Short Shaker Stop, R.....	.75
Short Shaker Stop, L.....	.75
Smoke Box Direct Draft Cover.....	3.75
Smoke Box Direct Draft Cover Liner.....	3.00
Quadrant Stem.....	.50

For all sizes  
46" American  
New Style

# Price List Repairs—Pierce American Smokeless (Updraft) Boiler

The prices for repair parts for Pierce American Smokeless (Updraft) Boilers are identical with those of the corresponding sizes of the standard Pierce American Boilers, with the sole exception of the drop sections of the Smokeless Boiler. The prices of these are as follows:

Drop Section for Series 26 Boiler.....	\$105.00	Drop Section for Series 40 Boiler.....	\$169.00
Drop Section for Series 32 Boiler.....	141.00	Drop Section for Series 46 Boiler.....	288.50

## Price List Repairs—Series "B" Down Draft Boiler

ARTICLE	No. 844	845	846	847	848	849	8410	8411	8412
Section, Right End.....	\$124.00	\$124.00	\$124.00	\$124.00	\$124.00	\$124.00	\$124.00	\$124.00	\$124.00
Section, Left End.....	124.00	124.00	124.00	124.00	124.00	124.00	124.00	124.00	124.00
Section, Tapped.....	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00
Section, Plain.....	106.00	106.00	106.00	106.00	106.00	106.00	106.00	106.00	106.00
Water Front.....	74.00	85.00	100.00	120.00	148.00	159.00	170.00	185.00	200.00
Water Column, see Steam Trimmings									

### BASE

Base End.....	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00	\$11.00
{ Base Front..... }	6.70	9.50	11.50	15.00	13.40	16.20	19.00	21.00	23.00
{ Number of Sections used for... }	4	5	6	7	2-4	1-4, 1-5	2-5	1-5, 1-6	2-6
Base Back—Lengths same as front.	13.60	15.60	19.50	25.00	27.00	29.20	31.20	35.10	39.00
Base Front Door.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Base Front Door Knob.....	.60	.60	.60	.60	.60	.60	.60	.60	.60
Base Front Connections.....	.....	.....	.....	.....	3.30	3.30	3.30	3.30	3.30
Base Back Connections.....	.....	.....	.....	.....	3.30	3.30	3.30	3.30	3.30

### MAGAZINE

Magazine End, Right.....	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Magazine End, Left.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Magazine Asbestos Strip.....	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00
Magazine Splice Plate.....	.....	.....	.....	.....	1.25	1.25	1.25	1.25	1.25
{ Magazine Top Plate..... }	10.00	11.75	14.00	18.00	20.00	21.75	23.50	25.75	30.00
{ Number of Sections used for... }	4	5	6	7	2-4	1-4, 1-5	2-5	1-5, 1-6	3-4
Number Plate with Feed Door.....	3.60	4.00	4.00	4.00	7.20	7.60	8.00	8.00	10.80



# Price List Repairs—Series "B" Down Draft Boiler (Continued)

ARTICLE	No. 844	845	846	847	848	849	8410	8411	8412
Grate, Shaker.....	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75	\$2.75
Grate, Non Shaker.....	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
Grate Clamp, R. H.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grate Clamp, L. H.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grate Clamp, Center.....	.60	.60	.60	.60	.60	.60	.60	.60	.60
Grate Gear.....	.60	.60	.60	.60	.60	.60	.60	.60	.60
Grate Gear Collar.....	.60	.60	.60	.60	.60	.60	.60	.60	.60
Great Gear Cover, R. H.....	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Grate Gear Cover, L. H.....	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Grate Gear Cover, Center.....	....	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Grate Hanger, Rear Connection.....	....	....	....	....	1.80	1.80	1.80	1.80	1.80
Grate Hanger, Rear Support.....	....	....	....	....	2.50	2.50	2.50	2.50	2.50
Grate Shaker Handle.....	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Baffle Plate, Small.....	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Baffle Plate, Large.....	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Coil Opening Frame.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coil Opening Plate.....	.50	.50	.50	.50	.50	.50	.50	.50	.50
Coil Opening Support.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
{Rear Grate Hanger.....}	2.00	3.60	4.75	6.15	4.00	5.60	7.20	8.35	9.50
{Number of Sections used for.....}	4	5	6	7	2-4	1-4, 1-5	2-5,	1-5, 1-6	2-6

# Price List Repairs—Series "B" Down Draft Boiler (Continued)

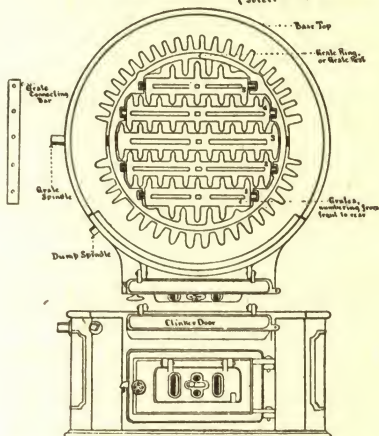
ARTICLE	No. 844	845	846	847	848	849	8410	8411	8412
Draft Door.....	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50
Draft Door Frame.....	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Draft Box End, Right.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Draft Box End, Left.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Draft Box Splice Strip, R.H. Lower.	.80	.80	.80	.80	.80	.80	.80	.80	.80
Draft Box Splice Strip, L.H. Lower.	.80	.80	.80	.80	.80	.80	.80	.80	.80
Draft Box Extension Plate, Lower..	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Draft Box Extension Plate, Upper..	1.40	1.40	2.40	2.80	1.40	5.30	5.30	5.30	5.30
Draft Box Splice Strip, Upper.....	.80	.80	.80	.80	.80	.80	.80	.80	.80
Draft Box Splice Strip, Inside.....	....	....	....	....	....	.80	.80	.80	.80
Draft Box Clean Out Door.....	....	....	....	....	....	.80	.80	.80	.80
Clinker Door.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Clinker Door Frame.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Clinker Door Lining.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Clinker Door Chute.....	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
Clinker Door Frame, L. H.....	....	2.50	....	....	....	2.50	2.50	2.50	....
Clinker Door Frame, R. H.....	....	2.50	....	....	....	2.50	2.50	2.50	....
Clean Out Door, Large.....	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60	5.60
Clean Out Door Frame, Large.....	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75

# Price List Repairs—Series "B" Down Draft Boiler (Continued)

ARTICLE	No. 844	845	846	847	848	849	8410	8411	8412
Clean Out Door Lining, Large.....	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Clean Out Door Fire Box.....	.90	.90	.90	.90	.90	.90	.90	.90	.90
Clean Out Door Fire Box Frame.....	.90	.90	.90	.90	.90	.90	.90	.90	.90
Clean Out Door Fire Box Lining.....	.60	.60	.60	.60	.60	.60	.60	.60	.60
Clean Out Door Comb. Chamber.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Clean Out Door with Slide in.....	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Clean Out Door with Slide in, Frame..	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Smoke Box.....	9.20	9.20	9.20	9.20	9.20	9.20	9.20	9.20	9.20
Smoke Box Connection Plate.....	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
Smoke Box Damper.....	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
Smoke Box Damper Stem.....	.80	.80	.80	.80	.80	.80	.80	.80	.80
Smoke Box Damper Quadrant.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Smoke Box Check Door.....	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Smoke Box Check Door Frame.....	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Smoke Box Check Door Lug.....	.50	.50	.50	.50	.50	.50	.50	.50	.50
Smoke Box Side Plate.....	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Smoke Box Outlet Cover.....	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
Smoke Box Collar 10".....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Nipple 4".....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Nipple 6".....	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Clean Out Door Rear.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Clean Out Door Rear Frame.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

# Price List Repairs "B" Bases

Style of Grates & Base for  
All "A," "B," "C" Grates and  
Modern  
Touraine (A) with "B" Grates  
Florida - 1900  
Soleil



THE "B"

Base and Grates are used on the following Pierce Boilers

No.	Modern	Touraine "B"	Florida, Jr.	Spence
No. 1 -3 Bars...	1	02-04-06	1501	10-110-310
No. 2 -3 Bars...	2	.....	1502	15-20-112
No. 2½-3 Bars...	....	2-4-6	....	120-320
No. 3 -5 Bars...	3	.....	1503	25-30-123
No. 4 -5 Bars...	4	08-8-10-12	1504	130-330
No. 4½-5 Bars...	4½	.....	....	32-35-40-134
No. 5 -5 Bars...	5	14-16-18	1505	140-332-340
No. 5¼-5 Bars...	....	.....	....	42-43-45-50-52
No. 5½-5 Bars...	....	.....	....	342-350-352
No. 6 -5 Bars...	6	.....	....	145-150
No. 6½-5 Bars...	....	20-22-24	....	156-160
No. 7 -7 Bars...	....	.....	....	51-53-55-60
No. 7c -9 Bars...	..	..	..	62-167-170
				360-362
				178-180
				63-65-70-72
				370-372
				73-75

# Price List Repairs—"B" Bases

Base Number.....	1-B	2-B	2½-B	3-B & 3½-B	4-B	4½-B
Asphalt Door.....	\$ 2.00	2.30	2.30	2.30	2.30	3.00
Asphalt Door Knob.....	.50	.50	.50	.50	.50	.50
Asphalt Draft Door.....	.75	.75	.75	.75	.75	1.00
Asphalt Draft Door Slide.....	.50	.50	.50	.50	.50	.50
Asphalt Draft Door Knob.....	.50	.50	.50	.50	.50	.50
Clinker Door.....	.75	.75	.75	.75	.75	1.00
Base Panel Front.....	6.00	7.00	7.25	7.25	9.00	11.00
Base Panel Rear.....	3.00	3.25	3.25	4.50	6.25	9.00
Base Panel, Right.....	3.00	4.00	4.00	4.50	5.50	7.40
Base Panel, Left.....	3.00	4.00	4.00	4.50	5.50	7.40
Base Bottom.....	11.50	13.00	13.00	18.00	23.00	31.00
Base Top.....	8.00	8.70	9.70	10.80	14.40	20.00
Grate Ring.....	4.20	5.00	5.50	5.75	8.20	12.00
Grate Bar No. 1, Front and Rear.....	1.85	2.00	2.00	1.80	1.90	3.20
Grate Bar No. 2, Front and Rear.....	.....	.....	.....	2.35	2.65	4.50
Shaker Grate Bar.....	2.40	2.80	2.80	2.90	3.00	4.70
Connecting Bar.....	.75	.75	.75	.75	.75	1.00
Shaker Lever.....	.75	.75	.75	1.00	1.00	1.75
Grate Spindle.....	.75	.75	.75	1.00	1.00	1.50
Dumping Spindle.....	.75	.75	.75	.75	.75	.75
Spindle Collar.....	.75	.75	.75	.75	.75	.75



# Price List Repairs—"B" Bases (Continued)

Base Number	5-B	5 1/4-B	5 1/2-B	6-B	6 1/2-B	7-B
Ashpit Door	3.00	3.00	3.00	3.00	3.00	3.00
Ashpit Door Knob	.50	.50	.50	.50	.50	.50
Ashpit Draft Door	1.00	1.00	1.00	1.00	1.00	1.00
Ashpit Draft Door Slide	.50	.50	.50	.50	.50	.50
Ashpit Draft Door Knob	.50	.50	.50	.50	.50	.50
Clinker Door	1.00	1.00	1.00	1.00	1.00	1.00
Base Panel Front	11.00	11.00	11.00	11.75	13.00	13.00
Base Panel Rear	9.00	9.00	9.00	9.00	10.50	10.50
Base Panel, Right	7.40	7.40	7.40	9.00	10.00	10.00
Base Panel, Left	7.40	7.40	7.40	9.00	10.00	10.00
Base Bottom	31.00	31.00	31.00	33.00	48.50	48.50
Base Top	20.00	20.00	21.00	22.50	27.25	27.25
Grate Ring	12.00	12.00	13.00	13.50	17.00	17.00
Grate Bar No. 1, Front and Rear	3.20	3.20	3.20	3.80	3.40	3.40
Grate Bar No. 2, Front and Rear	4.50	4.50	4.50	5.25	5.25	5.25
Grate Bar No. 3, Front and Rear						
Shaker Grate Bar	4.70	4.70	4.70	6.00	5.90	5.90
Connecting Bar	1.00	1.00	1.13	1.13	1.25	1.25
Shaker Lever	1.75	1.75	1.75	1.75	1.75	1.75
Grate Spindle	1.50	1.50	1.50	1.50	1.50	1.50
Dumping Spindle	.75	.75	.75	.75	.75	.75
Spindle Collar	.75	.75	.75	.75	.75	.75

# Price List Repairs—"D" Bases

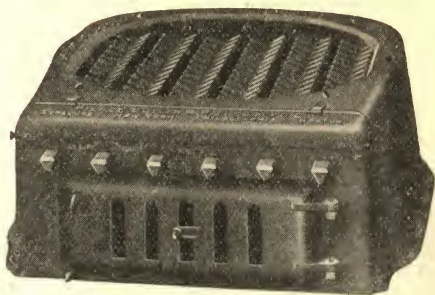
## NAME OF PART

	No. 1D	No. 2D	No. 3D	No. 4D	No. 5D	No. 6D	No. 6½D	No. 7D
Ashpit Door.....	\$2.50	\$2.75	\$3.00	\$3.50	\$4.00	\$4.00	\$4.50	\$4.50
Ashpit Door Knob.....	.50	.50	.50	.50	.50	.50	.50	.50
Ashpit Draft Door.....	1.00	1.00	1.50	1.50	1.50	1.50	1.75	1.75
Ashpit Draft Door Slide.....	.50	.50	.63	.63	.63	.63	.63	.63
Ashpit Draft Door Slide Knob.....	.50	.50	.50	.50	.50	.50	.50	.50
Base Panel Front.....	6.50	6.50	7.00	8.50	9.75	9.25	11.25	12.00
Base Panel Rear.....	4.38	6.00	7.50	7.50	9.25	8.25	11.00	10.00
Base Panel, Right.....	3.00	4.00	4.60	6.75	7.75	7.50	8.50	10.00
Base Panel, Left.....	3.00	4.00	4.25	6.75	7.75	7.50	8.25	8.25
Base Bottom.....	8.50	12.50	10.00	15.50	18.25	25.00	26.25	33.00
Base Bottom Cover.....	2.00	2.00	3.75	3.75	3.75	3.75	6.00	6.00
Base Top.....	16.00	18.75	20.00	23.00	25.00	33.00	30.63	32.75
Grate Bar No. 1, Front.....	4.00	5.00	6.50	5.63	7.75	7.25	7.75	9.25
Grate Bar No. 2, Front.....	.....	.....	.....	.....	.....	8.50	10.00	12.50
Grate Bar No. 3, Shaker.....	4.25	5.63	6.75	6.75	10.00	8.75	10.00	11.25
Grate Bar No. 4.....	.....	.....	.....	6.75	10.00	8.50	10.00	12.00
Grate Bar No. 5.....	4.00	4.60	6.25	5.50	8.25	6.75	7.50	8.50
Grate Connecting Bar.....	1.25	1.25	1.50	2.80	2.25	2.75	3.00	3.00
Grate Spindle.....	1.25	1.25	1.25	1.50	1.50	1.50	1.50	1.50
Shaker Lever.....	2.50	2.50	2.50	2.75	2.75	2.75	2.75	2.75

See illustration of "B" Base, page 289. The "D" Base is the same except that it is furnished with a coarser grate.

## List Price Repairs

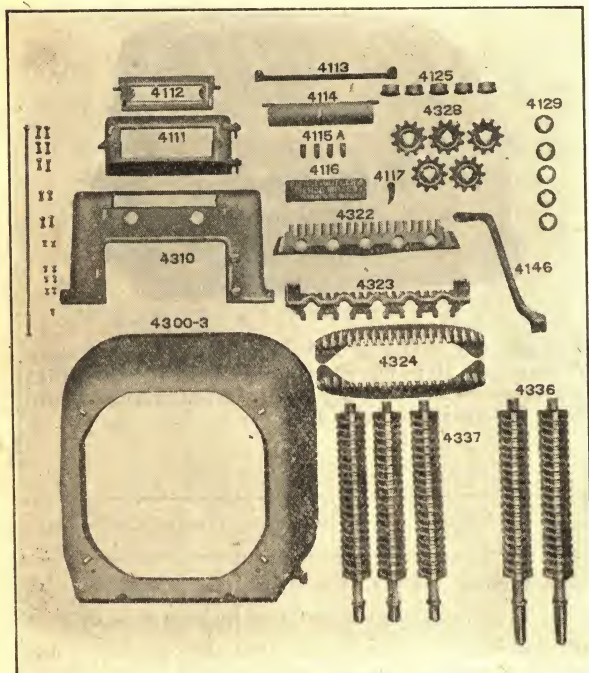
### 1912 Triangular Bar Grate and Base



Spence 400, 600 and 700 series, Touraine 300 series, Modern sizes 10 to 60, Florida Steam sizes 1521 to 1525, and Tropic Water sizes 1531 to 1535 were furnished with above base prior to July, 1913.

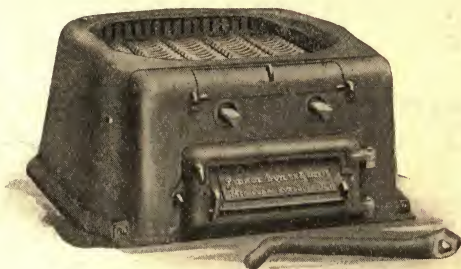
Diam. of Grate	17 in.	20 in.	22 in.	25 in.	27 in.	28 in.	31 in.
No. Bars per set.....	4	4	4	5	6	6	6
Shell.....	28.80	34.00	47.60	49.20	64.80	64.00	67.60
Back Grate Rest.....	2.80	3.20	3.60	4.00	4.40	4.40	6.40
Front Grate Binder....	2.00	2.40	2.40	2.80	3.20	3.20	3.60
Clinker Doors.....	2.00	2.80	3.40	3.60	4.00	3.80	4.40
Grate Bars (each).....	5.25	7.00	8.50	8.75	9.25	9.50	11.50
Front Grate Rest.....	6.40	7.20	7.60	8.00	10.80	11.20	11.60
Ashpit Doors.....	4.00	4.00	4.00	6.00	6.00	6.00	6.00
Shaker Handle.....	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Ashpit Door Slide.....	.60	.60	.60	1.00	1.00	1.00	1.00
Clinker Door Hinge....	.40	.40	.40	.40	.40	.40	.40
Grate Wheel.....	1.00	1.20	1.20	1.20	1.40	1.60	1.60

# Names of Parts of 1913 Triangular Base Patterns



- 4112 Base Front Draft Door
- 4111 Base Front
- 4300 Base Shell
- 4113 Base Front Ashpit Door Threshold
- 4114 Base Front Clinker Door
- 4115 Clinker Door Clips
- 4116 Ashpit Door Name Plate
- 4322 Rear Grate Support
- 4323 Front Grate Support
- 4324 Side Finger Bars
- 4336 Shaker Grate Bar
- 4125 Grate Bar Bearings
- 4328 Grate Bar Gear
- 4117 Draft Door Dog
- 4129 Gear Spacing Washer
- 4146 Shaker Handle
- 4337 Short Grate Bar

# 1913 Triangular Bar Grate and Base



## Boilers that 1913 Triangular Bar Bases will fit

No. of Base	Dia. of Grate	No. of Bars	Mod-ern	Touraine	400 Series Spence	600 Series Spence	700 Series Spence	Pebco
4100	17 in.	4 Bars	10T	.....	410T	610T	710T	913}
4200	19 in.	5 Bars	20T	.....	412T}	620T	720T	914}
					420T}			923}
4300	21½ in.	5 Bars	30T	302T}	423T}	630T	730T	924}
				304T}	430T}			933}
				306T}				934}
4400	25 in.	6 Bars	40T	338T}	434T}	640T	732T}	935}
				308T}	440T}		740T}	943}
				310T}				944}
4500	27 in.	6 Bars	45T	.....	445T}	650T	.....	945}
					450T}			.....
4600	28 in.	6 Bars	50T	314T}	456T}	660T}	742T}	953}
				316T}	460T}	665T}	750T}	954}
							752T}	955}
4700	31 in.	7 Bars	55T}	.....	467T}	670T}	760T}	963}
			60T}		470T}	675T}	762T}	964}
								965}

For complete list of parts see following page.



# Price List Repairs—1913 Triangular Bar Grate and Base

Number of Base.....	No. 4100	4200	4300	4400	4500	4600	4700
Diameter of Grate.....	17-in.	19-in.	21½-in.	25-in.	27-in.	28-in.	31-in.
Main Base Shell.....	\$21.75	\$26.20	\$36.00	\$38.00	\$40.00	\$41.00	\$52.50
Base Front.....	3.00	3.30	4.00	4.50	5.20	6.00	6.75
Base Front Top Bolt, each.....	.18	.18	.18	.18	.18	.18	.18
Base Front Bottom Bolt, each.....	.18	.18	.18	.18	.18	.18	.18
Base Front Clinker Door.....	1.05	1.05	1.05	1.25	1.25	1.25	1.25
Base Front Clinker Door Hinge.....	.35	.35	.35	.35	.35	.35	.35
Base Front Clinker Door Hinge Bolt.....	.18	.18	.18	.18	.18	.18	.18
Base Front Ashpit Door.....	1.70	1.70	1.70	2.80	2.80	2.80	2.80
Base Front Ashpit Door Threshold.....	.85	.85	.85	1.00	1.00	1.00	1.00
Base Front Threshold Bolts.....	.18	.18	.18	.18	.18	.18	.18
Ashpit Draft Door.....	.53	.53	.53	.85	.85	.85	.85
Ashpit Draft Door Dog.....	.35	.35	.35	.35	.35	.35	.35
Ashpit Draft Door Dog Bolt.....	.18	.18	.18	.18	.18	.18	.18
Ashpit Draft Door Hinge.....	.35	.35	.35	.35	.35	.35	.35
Ashpit Draft Door Hinge Bolt.....	.18	.18	.18	.18	.18	.18	.18
Ashpit Draft Door Nameplate.....	.35	.35	.35	.35	.35	.35	.35
Ashpit Draft Door Nameplate Bolts.....	.18	.18	.18	.18	.18	.18	.18
Shaker Grate Bar.....	2.35	2.80	3.50	3.50	4.25	5.00	4.70
Shaker Handle.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Short Grate Bar.....	2.25	2.65	3.25	3.25	3.75	4.80	4.50
Gear for Grate Bar.....	.50	.50	.50	.50	.60	.75	.75
Gear Spacing Washer.....	.35	.35	.35	.35	.35	.35	.35
Front Bearing for Grate Bar.....	.35	.35	.35	.35	.35	.35	.35
Lock Rod for Grates.....	.53	.53	.53	.61	.61	.61	.61
Finger Bars, R. and L.....	1.40	1.65	1.90	2.30	2.25	2.25	3.00
Finger Bar R. and L. Bolts.....	.18	.18	.18	.18	.18	.18	.18
Front Grate Support.....	2.30	2.45	2.75	3.00	3.30	3.55	3.80
Front Grate Support Bolts.....	.18	.18	.18	.18	.18	.18	.18
Rear Grate Support.....	1.65	2.25	2.75	2.75	3.15	3.55	3.80
Lug for Finger Bar Support.....	.....	.....	.....	.....	.35	.35	.35
Lug for Finger Bar Bolts.....	.....	.....	.....	.....	.18	.18	.18
Complete Base.....	41.98	51.68	63.48	69.53	73.31	79.16	92.06

## Price List Repairs—Pebco Boiler

Article	17"	19"	21½"	25"	28"	31"
Fire Pot.....	\$71.00	\$89.00	\$98.50	\$120.00	\$132.50	\$147.50
Fire Pot Ring.....	20.75	24.75	26.25	34.50	46.80	48.00
Flue Ring.....			23.00	34.25	42.00	43.50
Upper Flue Ring.....	18.75	22.00	24.75	34.25	42.00	44.25
Steam Dome.....	39.00	41.00	50.00	62.00	80.00	95.00
Water Dome.....	24.75	26.00	31.50	43.75	60.00	73.50
Dome Strip on Smoke Hood.....	.50	.50	.60	.75	.85	1.00
Fire Door.....	1.25	1.65	2.25	2.25	2.25	2.25
Fire Door Draft Wheel	.50	.50	.50	.50	.50	.50
Fire Door Frame.....	2.00	2.75	3.00	3.80	3.80	3.80
Fire Door Liner.....	.50	.85	1.00	1.00	1.00	1.00
Clean Out Door Front	.60	.60	.60	.60	.60	.60
Clean Out Door Frame	1.10	1.20	1.45	1.10	1.00	1.10
Clean Out Door Rear, Frame.....	.75	.75	.75	.75	.75	.75
Clean Out Door Rear, Top Frame.....				.75	.75	.75
Clinker Door.....	.75	1.00	1.00	1.00	1.00	1.00
Clinker Door Frame..	1.10	1.20	1.50	1.50	1.75	1.75
Clinker Door Liner...	.50	.60	.65	.65	.65	.95
Smoke Box R, carries check draft.....	2.30	2.35	2.90	3.55	3.80	4.10
Smoke Box L.....	2.00	2.10	2.80	3.55	3.80	4.10
Smoke Box Check Dr.	.50	.50	.60	.80	.80	.80
Smoke Box Check Door Ratchet.....	.50	.50	.50	.50	.50	.50
Smoke Box Damper...	.60	.60	.75	.75	.90	1.00
Smoke Box Dpr. Spg.	.25	.25	.25	.25	.25	.25
4-in. Push Nipples...	1.25	1.25	1.25	1.25	1.25	1.25
Wrt. Iron Rods & Nuts	1.00	1.00	1.00	1.00	1.00	1.00
Domestic Coil Cover..	.50	.50	.50	.50	.50	.50
Diaphragm Plunger ..	.50	.50	.50	.50	.50	.50
Diaphragm Stem.....	.50	.50	.50	.50	.50	.50
Diaphragm Weight....	1.50	1.50	1.50	1.50	1.50	1.50
Diaphragm Top, N. S.	1.05	1.05	1.05	1.05	1.05	1.05
Diaphragm Bottom...	1.15	1.15	1.15	1.15	1.15	1.15
Diaphragm Pin.....	.50	.50	.50	.50	.50	.50
For prices on Base and Grate Parts see previous pages	Use 4100 Base	Use 4200 Base	Use 4300 Base	Use 4400 Base	Use 4600 Base	Use 4700 Base

### OLD STYLE PARTS

Front Clean Out Door Frame.....	1.00	1.00	1.00	.....	.....	.....
Front Clean Out Door	.60	.60	.60	.....	.....	.....
Steam Dome.....	39.00	41.00	50.00	62.00	.....	.....
Dome Strip.....	.88	1.09	1.31	1.49	.....	.....
Rear Cleanout Door	.50	.50	.50	.50	.....	.....
Rear Clean Out Door Frame.....	1.00	1.00	1.00	1.00	.....	.....
Check Door.....	.50	.50	.50	.50	.....	.....
Smoke Hood Damper.	.60	.60	.75	.....	.....	.....

## Price List Repairs—Pierce Spence Boilers

Name of Part	110-B	112-B	120-B	123-B	130-B	134-B	140-B
Dome Ring.....	\$27.50	\$32.50	\$32.50	\$37.50	\$37.50	\$55.00	\$55.00
Fire Ring.....	30.00	...	35 00	....	40.63	..	57.50
							....
							....
Dome Ring....	145-B	150-B	156-B	160-B	167-B	170-B	178-B
Fire Ring.....	\$60.00	\$60.00	\$65.00	\$65.00	\$70.00	\$70.00	\$85.00
	...	61.25	...	67.50	....	72.50	..
							180-B
							\$85.00
							92.50
Number of Base..	110-B	112-B	120-B	123-B	130-B	134-B	140-B
Balance same as.....	1-B	2-B	2-B	3-B	3-B	4-B	4-B
	No. 110	No. 112	No. 120	No. 123	No. 130	No. 134	No. 140
							....
							....
							....
Number of Base.....	145-B	150-B	156-B	160-B	167-B	170-B	178-B
Balance same as.....	5¼-B	5¼-B	5½-B	5½-B	6-B	6-B	6½-B
	No. 145	No. 150	No. 156	No. 160	No. 167	No. 170	No. 178
							180-B
							6¼-B
							No. 180

For price on Bases see list of B Bases.

# Price List Repairs—Pierce Spence Boilers

ARTICLE	710-T 710 310	720-T 720 320	730-T 730 330	732-T 732 332	740-T 740 340	742-T 742 342
Coil Plate.....	\$.50	\$.50	\$.50	\$.50	\$.50	\$.50
Damper.....	.75	.75	1.25	1.25	1.25	1.50
Damper Quadrant.....	.63	.63	.63	.63	.63	.63
Damper Quadrant Stem.....	.50	.50	.50	.50	.50	.50
Damper Quadrant Thumbscrew.....	.25	.25	.25	.25	.25	.25
Dome Cap.....	5.15	6.76	10.00	14.50	14.50	18.00
Dome Cap Check Door.....	.50	.50	1.00	1.00	1.00	1.50
Dome Cap Check Door Frame.....	....	....	1.00	1.25	1.25	1.50
Dome Cap Check Door Catch.....	.50	.50	.50	.50	.50	.50
Flue Door Top.....	1.25	1.30	1.30	2.00	2.00	2.00
Flue Door Bottom.....	1.40	1.40	1.40	....	2.00	....
Flue Door Frame.....	5.00	4.35	4.35	2.75	2.75	3.00
Flue Door Knob.....	.50	.50	.50	.50	.50	.50
Fire Door.....	2.10	2.10	2.10	2.10	2.10	2.10
Fire Door Frame.....	2.40	2.60	2.75	3.00	3.00	3.00
Fire Door Liner.....	.60	.60	.75	.90	.90	.90
Fire Door Knob.....	.50	.50	.50	.50	.50	.50
Fire Door Slide.....	.50	.50	.50	.75	.75	.75
Fire Door Slide Knob.....	.50	.50	.50	.50	.50	.50
Flange.....	1.75	1.75	2.25	2.25	2.25	2.50
Firepot.....	65.00	92.00	110.00	147.00	147.00	175.00
Fire Ring No. 1.....	22.00	30.00	36.00	45.00	45.00	60.00

# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	710-T	720-T	730-T	732-T	740-T	742-T
Hole Ring No. 2.....	710	720	730	732	740	742
Flue Ring No. 3.....	310	320	330	332	340	342
Dome Ring No. 4.....	\$21.00	\$28.00	\$33.00	\$44.00	\$44.00	\$65.00
Smoke Pipe Check Door.....	23.50	30.00	35.00	43.00	43.00	65.00
Smoke Pipe Check Door Frame.....	22.00	29.00	34.00	43.00	43.00	65.00
Water Post.....	.50	.50	.75	.75	.75	.75
Branch Header Top.....	.75	.75	1.25	1.25	1.25	1.25
Branch Header Bottom.....	20.00	23.50	27.00	19.00	30.00	40.00
Packings.....	.....	.....	9.00	9.00	9.00	20.00
Base for 300 Series.....	3.75	4.50	9.00	7.50	7.50	22.00
	No. 1-B	No. 2-B	No. 3-B	No. 4-B	No. 4-B	No. 5-B

For list on Base Parts, see list on Bases.  
For list on Fire Tools, see list on Fire Tools.

Base for 700 Series, 1912 Triangular Bar Grate and Base	17 in.	20 in.	22 in.	25 in.	25 in.	28 in.
Base for 700-T series, 1913 Triangular Bar Grate and Base	No. 4100	No. 4200	No. 4300	No. 4400	No. 4400	No. 4600
<b>Number of Heater.....</b>	310-K	320-K	330-K	332-K	340-K	342-K
Dome Ring.....	26.00	30.00	35.50	49.00	49.00	72.50
Fire Ring.....	25.00	32.50	40.00	.....	50.00	65.00
Balance same as.....	No. 310	No. 320	No. 330	No. 332	No. 340	No. 342
<b>Number of Heater.....</b>	No. 10	No. 20	No. 30	No. 32	No. 40	No. 42
Firepot.....	77.50	112.00	132.50	167.00	167.00	212.50
Fire Door Frame.....	3.50	3.75	4.00	4.25	4.25	3.75
Balance same as.....	No. 310	No. 320	No. 330	No. 332	No. 340	No. 342



# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	750-T	752-T	760-T	762-T	770-T	772-T
Coil Plate.....	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50
Damper.....	1.50	1.50	1.50	1.50	1.75	1.75
Damper Quadrant.....	.83	.83	.83	.83	.83	.83
Damper Quadrant Stem.....	.50	.50	.50	.50	.50	.50
Damper Quadrant Thumbscrew.....	.25	.25	.25	.25	.25	.25
Dome Cap.....	18.00	18.00	28.00	28.00	31.00	31.00
Dome Cap Check Door.....	1.50	1.50	1.50	1.50	1.50	1.50
Dome Cap Check Door Frame.....	1.50	1.50	1.50	1.50	1.50	1.50
Dome Cap Check Door Catch.....	.50	.50	.50	.50	.50	.50
Flue Door Top.....	2.50	2.50	2.50	2.50	2.50	2.50
Flue Door Bottom.....	2.50	3.25	2.50	4.00	2.50	4.00
Flue Door Frame.....	5.60	7.00	7.25	8.00	7.00	8.00
Flue Door Knob.....	.50	.50	.50	.50	.50	.50
Fire Door.....	2.30	2.30	2.50	2.50	2.50	2.50
Fire Door Frame.....	3.00	3.00	3.00	3.00	3.00	3.00
Fire Door Liner.....	.90	1.25	1.25	1.25	1.25	1.25
Fire Door Knob.....	.50	.50	.50	.50	.50	.50
Fire Door Slide.....	.75	.75	.88	.88	.88	.88
Fire Door Slide Knob.....	.50	.50	.50	.50	.50	.50
Flange.....	2.50	2.50	2.50	2.50	3.50	3.50
Firepot.....	175.00	175.00	195.00	195.00	205.00	205.00
Fire Ring No. 1.....	60.00	60.00	75.00	75.00	97.00	97.00

# Price List Repairs—Pierce Spence Boilers (Continued)

## ARTICLE

Hole Ring No. 2.....	750-T	752-T	760-T	762-T	770-T	772-T
Flue Ring No. 3.....	750	752	760	762	770	772
Dome Ring No. 4.....	350	352	360	362	370	372
Smoke Pipe Check Door.....	\$59.00	\$59.00	\$70.00	\$70.00	\$94.00	\$94.00
Smoke Pipe Check Door Frame.....	65.00	65.00	75.00	75.00	95.00	95.00
Water Post.....	65.00	65.00	85.00	85.00	107.50	107.50
Branch Header Top.....	75	75	1.25	1.25	1.25	1.25
Branch Header Bottom.....	1.25	1.25	1.75	1.75	1.75	1.75
Packings.....	50.00	57.00	57.00	65.50	59.00	68.00
Base for 300 series.....	20.00	20.00	20.00	20.00	23.50	23.50
	22.00	22.00	22.00	22.00	26.50	26.50
	8.50	9.25	8.75	9.50	10.00	10.75
	No. 5-B	No. 5-B	No. 6-B	No. 6-B	No. 7-B	No. 7-B

For list on Base Parts, see list on Bases.

For list on Fire Tools, see list on Fire Tools.

Base for 700 series, 1912 Triangular Bar Grate and Base.....	28 in.	31 in.	31 in.
Base for 700-T series, 1913 Triangular Bar Grate and Base.....	No. 4600	No. 4700	No. 4700

Do not furnish

Do not furnish

## Number of Heater.....

Dome Ring.....	350-K	352-K	360-K	362-K	370-K	372-K
Fire Ring.....	\$70.00	\$70.00	\$82.50	\$82.50	\$97.50	\$97.50
Balance same as.....	65.00	77.50	77.50	77.50	102.50	102.50
	No. 450	No. 352	No. 360	No. 362	No. 370	No. 372

## Number of Heater.....

Firepot.....	No. 50	No. 52	No. 60	No. 62	No. 70	No. 72
Firepot Door Frame.....	\$212.50	\$212.50	\$245.00	\$245.00	\$312.50	\$312.50
Balance same as.....	3.75	3.75	4.25	4.25	4.25	4.25
	No. 350	No. 352	No. 360	No. 362	No. 370	No. 372

# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	410-T 110	412-T 112	420-T 120	423-T 123	430-T 130	434-T 134	440-T 140
Coil Plate.....	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50
Clinker Door.....	.75	.75	.75	1.00	1.00	1.00	1.00
Clinker Door Frame.....	1.50	1.50	1.50	1.85	1.85	1.85	1.85
Dome Cap.....	6.25	7.50	7.50	10.00	10.00	15.00	15.00
Dome Cap Check Door.....	.63	.63	.63	.75	.75	.75	.75
Dome Cap Check Door Frame.....	.75	.75	.75	.88	.88	.88	.88
Dome Cap Check Door Catch.....	.50	.50	.50	.50	.50	.50	.50
Dome Cap C. O. Door.....	.50	.75	.75	.75	.75	.75	.75
Dome Cap C. O. Door Knob.....	.50	.50	.50	.50	.50	.50	.50
Damper.....	.75	.75	.75	1.00	1.00	1.00	1.00
Damper Quadrant.....	.63	.63	.63	.63	.63	.63	.63
Damper Quadrant Stem.....	.50	.50	.50	.50	.50	.50	.50
Damper Quadrant Thumbscrew.....	.25	.25	.25	.25	.25	.25	.25
Flue Door.....	.75	.75	.75	.88	.88	.88	.88
Flue Door Frame.....	1.00	1.00	1.00	1.25	1.25	1.25	1.25
Flue Door Knob.....	.75	.75	.75	.75	.75	.75	.75
Fire Door.....	2.00	2.00	2.00	2.25	2.25	2.25	2.25
Fire Door Frame.....	3.25	3.50	3.50	4.25	4.25	4.25	4.25
Fire Door Liner.....	1.15	1.15	1.15	1.50	1.50	1.50	1.50

# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	410-T 110	412-T 112	420-T 120	423-T 123	430-T 130	434-T 134	440-T 140
Fire Door Knob.....	.50	.50	.50	.50	.50	.50	.50
Fire Door Slide.....	.50	.50	.50	.75	.75	.75	.75
Fire Door Slide Knob.....	.50	.50	.50	.50	.50	.50	.50
Flange.....	2.00	2.00	2.00	2.00	2.00	3.00	3.00
Firepot.....	75.00	91.00	91.00	100.00	100.00	136.00	136.00
Fire Ring, Section No. 1.....	27.00	34.00	34.00	40.00	40.00	54.00	54.00
Hole Ring, Section No. 2.....	23.00	30.00	30.00	35.00	35.00	47.00	47.00
Flue Ring, Section No. 3.....	24.00	30.00	30.00	36.00	36.00	48.00	48.00
Dome Ring, Section No. 4.....	24.00	30.00	30.00	37.50	37.50	48.50	48.50
Smoke Pipe Check Door.....	.50	.50	.50	.75	.75	.75	.75
Smoke Pipe Check Door Frame.....	.75	.75	.75	1.00	1.00	1.00	1.00
Regular Water Post.....	27.00	34.50	40.00	34.50	40.00	39.00	46.00
Branch Header Top.....	11.00	11.00	11.00	11.00	11.00	11.50	11.50
Branch Header Bottom.....	9.00	9.00	9.00	9.00	9.00	10.00	10.00
Packings.....	5.00	5.00	5.75	5.00	5.75	6.00	6.50
Base for 400 T series, 1913 Triangular Bar							
Grate and Base.....	No. 4100	No. 4200	No. 4200	No. 4300	No. 4300	No. 4400	No. 4400
Base for 100 series.....	1-D	2-D	2-D	3-D	3-D	4-D	4-D

For list on Base Parts and Fire Tools, see Base and Fire Tool list.

# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	445-T 145	450-T 150	456-T 156	460-T 160	467-T 167	470-T 170	478-T 178	480-T 180
Coil Plate.....	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50	\$ .50
Clinker Door.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Clinker Door Frame.....	1.85	1.85	1.85	1.85	2.00	2.00	2.00	2.00
Dome Cap.....	20.00	20.00	20.00	20.00	26.00	26.00	30.00	30.00
Dome Cap Check Door.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Dome Cap Check Door Frame...	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Dome Cap Check Door Catch...	.50	.50	.50	.50	.50	.50	.50	.50
Dome Cap C. O. Door.....	.75	.75	.75	.75	1.00	1.00	1.00	1.00
Dome Cap C. O. Door Knob....	.50	.50	.50	.50	.50	.50	.50	.50
Damper.....	1.50	1.50	1.50	1.50	1.50	1.50	2.00	2.00
Damper Quadrant.....	.63	.63	.63	.63	.63	.63	.63	.63
Damper Quadrant Stem.....	.50	.50	.50	.50	.50	.50	.50	.50
Damper Quadrant Thumbscrew..	.25	.25	.25	.25	.25	.25	.25	.25
Flue Door.....	.88	.88	.88	.88	1.13	1.13	1.13	1.13
Flue Door Frame.....	1.50	1.50	1.50	1.50	1.50	1.50	1.75	1.75
Flue Door Knob.....	.75	.75	.75	.75	.75	.75	.75	.75
Fire Door.....	2.25	2.25	3.00	3.00	3.00	3.00	3.00	3.00
Fire Door Frame.....	4.00	4.00	4.75	4.75	5.00	5.00	5.00	5.00
Fire Door Liner.....	1.50	1.75	1.75	1.75	1.75	1.75	1.75	1.75



# Price List Repairs—Pierce Spence Boilers (Continued)

Article	445-T 145	450-T 150	456-T 156	460-T 160	467-T 167	470-T 170	478-T 178	480-T 180
Fire Door Knob .....	.50	.50	.50	.50	.50	.50	.50	.50
Fire Door Slide .....	.75	.75	.75	.75	.75	.75	.75	.75
Fire Door Slide Knob .....	.50	.50	.50	.50	.50	.50	.50	.50
Flange .....	3.00	3.00	3.75	3.75	3.75	3.75	3.75	3.75
Firepot .....	140.00	140.00	156.00	156.00	178.00	178.00	195.00	195.00
Fire Ring, Section No. 1 .....	62.00	62.00	66.50	66.50	75.00	75.00	90.00	90.00
Hole Ring, Section No. 2 .....	56.00	56.00	57.00	57.00	70.00	70.00	80.00	80.00
Flue Ring, Section No. 3 .....	55.00	55.00	58.00	58.00	70.00	70.00	80.00	80.00
Dome Ring, Section No. 4 .....	57.50	57.50	60.00	60.00	69.00	69.00	80.00	80.00
Smoke Pipe Check Door .....	.75	.75	.75	.75	.75	.75	1.00	1.00
Smoke Pipe Ck. Door Frame .....	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25
Back Outlet Water Post .....	.....	.....	60.00	65.50	60.00	65.50	54.00	60.00
Regular Water Post .....	39.00	46.00	48.00	57.00	48.00	57.00	50.00	58.00
Branch Header Top .....	24.00	24.00	27.00	27.00	27.00	27.00	27.00	27.00
Branch Header Bottom .....	28.50	28.50	34.75	34.75	34.75	34.75	34.75	34.75
Packing .....	6.00	6.50	9.50	10.00	9.50	10.00	9.50	10.50
Base for 400-T series, 1913 Triangular	No.	No.	No.	No.	No.	No.	None	None
Bar Grate and Base .....	4500	4500	4600	4600	4700	4700	7-D	7-D
Base for 100 Series .....	5-D	5-D	6-D	6-D	6½-D	6½-D	7-D	7-D

For list on Base Parts and Fire Tools, see Base and Fire Tool List.

# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	510 210	512 212	520 220	523 223	530 230	534 234	540 240
Base Panel Front.....	\$ 9.00	\$ 9.25	\$ 9.25	\$12.00	\$12.00	\$12.00	\$12.00
Base Panel Rear.....	6.25	8.75	8.00	10.00	10.00	10.00	10.00
Base Panel, Right.....	3.60	4.60	4.60	6.80	6.80	9.00	9.00
Base Panel, Left.....	3.60	4.60	4.60	6.80	6.80	9.00	9.00
Base Bottom.....	7.50	11.00	11.00	9.00	9.00	14.50	14.50
Base Bottom Cover.....	1.65	1.65	1.65	3.30	3.30	3.30	3.30
Base Top.....	14.75	17.25	17.25	18.75	18.75	21.00	21.00
Grate Bar No. 1, Front.....	3.00	4.00	4.00	5.00	5.00	4.50	4.50
Grate Bar No. 3 Shaker.....	3.30	4.50	4.50	5.30	5.30	5.30	5.30
Grate Bar No. 4.....	3.00	4.00	4.00	5.00	5.00	5.30	5.30
Grate Bar No. 5, Rear.....	1.25	1.25	1.25	1.50	1.50	2.00	2.00
Grate Connecting Bar.....	1.25	1.25	1.25	1.25	1.25	1.50	1.50
Grate Spindle.....	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Shaker Lever.....	2.25	3.00	3.00	3.25	3.25	3.75	3.75
Sifting Grate, R. or L.....	1.25	1.25	1.25	2.00	2.00	2.50	2.50
Sifting Grate Chute, R. or L.....	75	1.00	1.00	1.00	1.00	1.13	1.13
Sifting Grate Shield, Front.....	1.00	1.00	1.00	1.13	1.13	1.25	1.25
Sifting Grate Shield, Rear Top.....	1.00	1.00	1.00	1.13	1.13	1.13	1.13
Sifting Grate Shield, Rear Bottom.....	2.50	2.75	2.75	3.00	3.00	3.25	3.25
Sifting Grate Rest.....	1.25	1.50	1.50	1.75	1.75	2.00	2.00
Sifting Grate Conn. Bar.....	.63	.63	.63	.63	.63	.63	.63
Sifting Grate Shaker Handle.....	2.00	2.50	2.50	2.75	2.75	3.00	3.00
Asphalt Door Top.....	1.00	1.00	1.00	1.50	1.50	1.50	1.50
Asphalt Door Check.....	.50	.50	.50	.63	.63	.63	.63
Asphalt Door Check Slide.....	.50	.50	.50	.50	.50	.50	.50
Asphalt Door Ck. Slide Knob.....	.50	.50	.50	.50	.50	.50	.50
Asphalt Door Knob.....	1.75	1.75	1.75	2.30	2.30	2.60	2.60
Asphalt Door, Lower.....	.50	.50	.50	.50	.50	.50	.50
Asphalt Door Knob.....	.50	.50	.50	.50	.50	.50	.50
Balance of Boiler same as.....	No. 110	No. 112	No. 120	No. 123	No. 130	No. 134	No. 140

# Price List Repairs—Pierce Spence Boilers (Continued)

ARTICLE	545	550	556	560	567	570	578	580
Base Panel Front.....	245	250	256	260	267	270	278	280
Base Panel Rear.....	\$14.00	\$14.00	\$14.00	\$14.00	\$15.50	\$15.50	\$16.00	\$16.00
Base Panel, Right.....	12.50	12.50	12.60	12.60	14.00	14.00	15.00	15.00
Base Panel, Left.....	9.00	9.00	10.50	10.50	12.00	12.00	14.50	14.50
Base Bottom.....	17.00	17.00	23.00	23.00	21.00	21.00	23.50	23.50
Base Bottom Cover.....	3.30	3.30	3.30	3.30	5.40	5.40	5.40	5.40
Base Top.....	23.50	23.50	25.00	25.00	28.50	28.50	30.00	30.00
Grate Bar No. 1, Front.....	6.00	6.00	5.80	5.80	6.00	6.00	7.00	7.00
Grate Bar No. 2.....	7.65	7.65	7.00	7.00	8.00	8.00	9.75	9.75
Grate Bar No. 3 Shaker.....	5.30	5.30	7.00	7.00	8.00	8.00	9.50	9.50
Grate Bar No. 4.....	6.00	6.00	5.80	5.80	6.00	6.00	7.00	7.00
Grate Bar No. 5, Rear.....	2.25	2.25	3.00	3.00	3.25	3.25	3.25	3.25
Grate Connecting Bar.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Grate Spindle.....	2.25	2.25	2.25	2.25	2.25	2.50	2.50	2.50
Shaker Lever.....	4.75	4.75	5.25	5.25	6.00	6.00	6.75	6.75
Sifting Grate, R. or L.....	3.00	3.00	4.00	4.00	4.25	4.25	5.00	5.00
Sifting Grate Chute, R. or L.....	1.13	1.13	1.38	1.38	1.50	1.50	1.50	1.50
Sifting Grate Shield, Front.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Sifting Grate Shield, Rear Top.....	1.75	1.75	1.75	1.75	1.75	1.75	1.88	1.88
Sifting Grate Shield, Rear Bottom.....	3.50	3.50	3.75	3.75	4.00	4.00	4.25	4.25
Sifting Grate Rest.....	2.00	2.00	2.25	2.25	2.25	2.25	2.50	2.50
Sifting Grate Connecting Bar.....	.63	.63	.63	.63	.63	.63	.63	.63
Sifting Grate Shaker Handle.....	3.25	3.25	3.25	3.25	3.60	3.60	3.60	3.60
Asphit Door Top.....	1.50	1.50	1.50	1.50	1.75	1.75	1.75	1.75
Asphit Door Check.....	.63	.63	.63	.63	.63	.63	.63	.63
Asphit Door Check Slide.....	.50	.50	.50	.50	.50	.50	.50	.50
Asphit Door Check Slide Knob.....	.50	.50	.50	.50	.50	.50	.50	.50
Asphit Door Knob.....	2.60	2.60	2.80	2.80	3.75	3.75	3.75	3.75
Asphit Door, Lower.....	.50	.50	.50	.50	.50	.50	.50	.50
Asphit Door Knob.....	.50	.50	.50	.50	.50	.50	.50	.50
Balance of Boiler same as.....	No. 145	No. 150	No. 156	No. 160	No. 167	No. 170	No. 178	No. 180

# List Prices on Fire Tools

## FLUE BRUSHES

Without Handles

Flue Brushes for Spence and Pebco.....	\$ 1.00
Flue Brushes for 21" and 26" American.....	1.20
Flue Brushes for 32", 40", 46" American.....	1.40

## POKER

Round Boilers, 15-24" Grate.....	1.50
Round Boilers, 26-27" Grate.....	2.00
Round Boilers, larger than 27" Grate.....	2.50
Sectional Boilers, 21".....	3.00
Sectional Boilers, 26".....	5.50
Sectional Boilers, 32" and 40".....	8.00
Sectional Boilers, 46".....	9.00

## SLICE BAR

Round Boiler, 15-24" Grate.....	2.00
Round Boiler, 26-27" Grate.....	2.50
Round Boiler, larger than 27" Grate.....	3.00
Sectional Boiler, 21".....	3.00
Sectional Boiler, 26".....	6.00
Sectional Boiler, 32-40".....	8.00
Sectional Boiler, 46".....	10.00

## HOE AND HANDLE

Round Boiler, 15-24" Grate.....	\$ 2.00
Round Boiler, 26-27" Grate.....	2.50
Round Boiler, larger than 27".....	3.00
Sectional Boiler, 21".....	3.00
Sectional Boiler, 26".....	6.00
Sectional Boiler, 32-40".....	8.00
Sectional Boiler, 46".....	10.00

## SCRAPER

Round Boiler, 15-24" Grate.....	\$ 1.50
Round Boiler, 26-27" Grate.....	1.50
Round Boiler, larger than 27".....	2.00

# List Prices on Steam Trimmings

Water Column	All styles of Florida Boilers...	
	American Nos. 51 to 58. Soleil	
	Old Style R. & B., Modern...	\$7.00
	Sterling, Touraine, Ontario...	
	Touraine Jr., Florida Jr. ....	
	Modern.....	
	American. 21", 26", 32", 40".....	5.00
	American, 46", 600 series, 700 series.....	7 00
	American, 400 series, 500 series.....	5.00
Water Bottle	All styles of Florida Boilers...	
	Soleil, American 51 to 58. ....	
	Old style R. & B., Modern....	
	Sterling, Ontario.....	6.50
	Touraine Jr., Florida Jr. ....	
	Modern.....	
	Touraine.....	6.50
	American, 46", 400, 500, 600, 700.. }	
Steam Gauges	3½" Steam Gauges.....	5.00
	5" Steam Gauges.....	6 00



## List Prices on Steam Trimmings (Continued)

Rubber			
Diaphragm			
Regulators			
	All style Florida Boilers. . . . .		\$10.00
	Soleil, old style R. & B., Modern. . . . .		
	Sterling, Ontario, Touraine Jr. . . . .		
	Modern. . . . .		
	American Nos. 51 to 58, American 46" . . . . .		
	American 400 series, 500 series, 600 series, 700 series. . . . .		9.38
	Touraine, American 21", 26", 32", 40". . . . .		
	Florida Jr. . . . .		10.63
Diaphragm Rubbers, 8" . . . . .			1.50
Diaphragm Rubbers, 10" . . . . .			1.75
Try or Gauge Cocks for all boilers . . . . .			1.25
Water Gauges for all boilers with Glass and Rods. . . . .			3.25
Glass for water gauges. . . . .			.50
Rods for water gauges, per set. . . . .			.50

# Price List Repairs—Pierce Hot Water Supply Boiler

Article	1010	1012	1015	1110	1112	1115	1117	1119	1122
Top Plate .....	2.45	3.40	4.50						
Flue Top .....	2.35	3.30	3.90						
Cover .....	.60	.60	.60						
Flue Top Clip .....	.25	.25	.25						
Firepot .....	28.50	33.60	55.20	28.50	33.60	55.20	78.00	97.50	108.00
Dome .....	.....	.....	.....	9.50	12.90	19.80	27.00	36.00	48.50
Smoke Collar .....	.....	.....	.....	.90	1.00	1.10	1.10	1.15	1.50
Fire Door .....	.....	.....	.....	1.00	1.10	1.20	1.50	1.95	2.10
Fire Door Slide .....	.....	.....	.....	.25	.25	.25	.25	.25	.25
Fire Door Liner .....	.....	.....	.....	.60	.65	.75	.75	1.00	1.00
Fire Door Frame .....	.....	.....	.....	2.10	2.45	2.50	2.50	2.65	3.10
Base Shell .....	7.50	9.60	13.20	7.50	9.60	13.20	.....	.....	.....
Base Front .....	1.00	1.15	1.40	1.00	1.15	1.40	.....	.....	.....
Base Front Door .....	1.00	1.15	1.40	1.00	1.15	1.40	.....	.....	.....
Draft Door .....	.35	.35	.35	.35	.35	.35	(Takes)	(Takes)	(Takes)
Draft Door Catch .....	.25	.25	.25	.25	.25	.25	(4100)	(4200)	(4300)
Grate .....	.65	1.10	1.35	.65	1.10	1.35	(Base)	(Base)	(Base)
Grate Hanger .....	.35	.50	.50	.35	.50	.50			
Grate Gear .....	.25	.25	.25	.25	.25	.25			
Shaker Opening Cover .....	.25	.25	.25	.25	.25	.25			
Shaker Handle .....	.50	.50	.50	.50	.50	.50			

## Price List Repairs

### Laundry Stoves

ARTICLE	111	123	101	112
Firepot Brick Ring.....	\$6.15	\$6.15	....	....
Firepot Water Back.....	7.50	\$12.00	\$22.40	\$27.30
Top Body.....	5.70	5.70	5.70	6.80
Top Body Baffle Plate.....	1.25	1.25	1.25	1.50
Top Body Feed Door.....	1.25	1.25	1.25	1.75
Top Plate.....	5.00	5.00	5.00	7.25
Top Plate Center.....	1.25	1.25	1.25	1.25
Top Plate Griddle, each....	1.75	1.75	1.75	1.75
Top Lifter.....	.75	.75	.75	.75
Low Down Ring.....	4.60	4.60	4.60	4.90
Base Body.....	4.60	4.60	4.60	6.75
Base Bottom.....	6.50	6.50	6.50	11.25
Base Bottom Legs, each.....	.75	.75	.75	.75
Blower.....	1.88	1.88	1.88	2.88
Blower Door.....	.75	.75	.75	1.00
Blower Door Slide.....	.50	.50	.50	.75
Blower Door Knob.....	.50	.50	.50	.50
Grate Complete.....	2.50	2.50	2.50	4.25
Grate Ring.....	1.30	1.30	1.30	2.35
Grate Rest.....	.70	.70	.70	1.20
Grate Swing Center.....	.50	.50	.50	.70
Shaker Lever.....	.75	.75	.75	1.00
Brick, per set.....	1.75	1.50	....	....

# Telegraph Code

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## Instructions for Using

Code words have been provided for every Boiler and Tank Heater priced in this book. Simply quoting code words correctly either by telegraph, cable or mail and stating the number wanted is all that is necessary to order the article indicated by the Code of Words used.

In writing a cipher message relative to Ordering, Quotations, Correspondence, etc., please observe the following:

First, begin every cipher word with a capital letter.

Second, wherever a blank occurs in a sentence, the word or words supplying such blank must immediately follow the cipher word of the sentence.

### FOR ORDERING

Ship via Fast Freight.....	Abbey
Ship via Express.....	Twig
Ship by Boat.....	Thews
Ship via Rail or Canal.....	Achieve
Ship in Car Loads.....	Twine
Ship via cheapest route.....	Advance
Ship via quickest route.....	Advent
Ship immediately.....	Advice
Ship today sure.....	Affix
As soon as possible.....	Afraid
Ship by N. Y.C. & H. R. R.....	Cherry
Ship via West Shore R. R.....	Hemlock
Ship via D. L. & W. R. R.....	Poplar
Ship via R. W. & O. R. R.....	Birch
Ship via N. Y. O. & W. R. R.....	Cedar
Ship via M. C. R. R.....	Spleen
Ship via L. S. & M. S. R. R.....	Pine

# Telegraph Code

FOR ORDERING—Continued

Ship via Merchants' Despatch.....	Hickory
Ship via N. Y., N. H. & H. R. R.....	Mayor
Ship via Central R. R. N. J.....	Measure
Ship via Baltimore & Ohio.....	Mechanic
Ship via Long Island R. R.....	Medical
Ship via Lehigh Valley R. R.....	Meditate
Ship via Erie R. R.... .	Medium
Ship via Pennsylvania R. R.....	Medlar
Ship via Philadelphia & Reading.....	Melody
Ship via N. Y., Susquehanna & Western Railroad.....	Member
Ship via Boston & Albany.....	Merchant
Ship via Boston & Maine.....	Mercury
Ship via Eastern Steamship Company....	Mermaid
In addition to previous order.....	Alloting
Wanted at once. When will you ship? Answer by telegraph.....	Agast
We are entirely out and urgently in want of.....	Allege
Enter our order for.....	Alloy
Duplicate order.....	Almanac
Duplicate order, if at.....	Alum
Ship the whole order in one lot.....	Amass
Have sent particulars by mail.....	Anchor
Ship at once any portion of order.....	Ancient
Have sent shipping directions by mail....	Angel
If you cannot ship by the time specified, advise by telegraph.....	Ankle
Rush shipment of my order No.....	Autumn
We are entirely out of.....	Apricot
We must have.....	Array
——— order of the.....	Arrest
Please alter our order to.....	Arrow
If not already executed, cancel.....	Artful
Cancel balance o order.....	Artist
Cancel order unless shipped by.....	Assay
Send tracer for shipment order ———	
Urgently needed.....	Assign



# Telegraph Code

FOR ORDERING—Continued

Specifications to follow.....	Attic
Telegraph number of cars and route shipped.....	Augur
If possible to ship at once, consider this an order. If not, do not enter order, but advise immediately how soon you can furnish .....	Aurora
Ship what you have in stock and ship balance as soon as possible... ..	Abroad
Send us bill of lading covering our order No. —.....	Appal
Enter order per enquiry of.....	Aptness
Will send shipping instructions by mail...	Auble
Do not hold for other orders, but rush quickly as possible.....	Arcade
Forward a small lot unless you have carload going at once.....	Apres
When can you make shipment?.....	Approof
When will order (No. or date) be shipped?	Appuyer
When and by what route did you ship our order (No. or date).....	Appentine
Add to our order (No. or date).....	Appetible
Omit ——— from our order (No. or date).....	Apportion
Hold for instructions order (No. or date)	Append
Order for immediate shipment.....	Attact
Prepare for immediate shipment after receipt of my order.....	Avert

# Telegraph Code

## FOR DESIGNATING STANDARD WROUGHT PIPE

No. Feet		Size	Black	Size	Galvanized
25	Africa	$\frac{1}{8}$	Allegheny	$\frac{1}{4}$	Amazon
50	Alabama	$\frac{1}{4}$	Baltimore	$\frac{3}{8}$	Bay
75	Cuba	$\frac{3}{8}$	Camden	$\frac{1}{2}$	Colorado
100	Asia	$\frac{1}{2}$	Detroit	$\frac{3}{4}$	Danube
200	Belgium	$\frac{3}{4}$	Erie	1	Elbe
300	Chili	1	Fairmount	$1\frac{1}{4}$	Firth
400	Denmark	$1\frac{1}{4}$	Galena	$1\frac{1}{2}$	Ganega
500	Egypt	$1\frac{1}{2}$	Harrisburg	2	Hudson
600	France	2	Ithaca	$2\frac{1}{2}$	Indus
700	Germany	$2\frac{1}{2}$	Jamestown	3	Juniata
800	Holland	3	Kensington	$3\frac{1}{2}$	Kanawha
900	Ireland	$3\frac{1}{2}$	Lancaster	4	Lake
1000	Japan	4	Macon	$4\frac{1}{2}$	Miami
1500	Jersey	$4\frac{1}{2}$	Quincy	5	Nile
2000	Kentucky	5	Newark	6	Osage
2500	Kansas	6	Oneida	7	Po
3000	Liberia	7	Paris	8	Rhine
3500	Lapland	8	Reading	9	Seine
4000	Maine	9	Salem	10	Tweed
4500	Mexico	10	Troy	11	Volga
5000	Nevada	11	Utica	12	Yellowstone
6000	Ohio	12	Venice		
7000	Peru	13	Venango		
8000	Russia	14	Warren		
9000	Spain	15	York		
10000	Texas	16	Zanesville		
15000	Tennessee				
20000	Uruguay				
25000	Wales				
50000	Venezuela				
75000	Virginia				
100000	Wyoming				
150000	Washington				
200000	Wisconsin				

## FOR INQUIRING AND PURCHASING

### Questions

At what price can you furnish — ?....	Rack
At what price, and how soon can you furnish — ?.....	Rhyme
How soon can you furnish ?.....	Race
Can you furnish from stock ? If not, how long will it take you to make ?.....	Racket

# Telegraph Code

FOR INQUIRING AND PURCHASING—Continued

## Questions

Have you in stock? If not all, how many or much?.....	Rafter
How long will it take you to make and ship?.....	Rage
When will you ship our order?.....	Rail
Can you ship by ——? .....	Raiment
Have you in stock and can you furnish?...	Ride
If so, enter order.....	Ram
At what discount will you sell us ——?..	Range
What discount on ——?.....	Refer
Delivered in our city.....	Rapid
Will send particulars by mail.....	Rascal
See letter.....	Raven
Particulars go by mail.....	Ray
If not satisfactory, telegraph at once....	Rebate
Please reply immediately by telegraph....	Recite
Must have an answer by ——.....	Reclining
Please answer our letter of the ——.....	Record
Please answer our telegram of ——.....	Redeem
Why don't you answer? .....	Reduce
May we accept for ——?.....	Refit
What is the lowest freight on?.....	Room
Wire greatest freight allowance on shipment to.....	Refract
Get through rate of freight.....	Regard
What terms are required.....	Relax
Order is tendered conditional upon prompt shipment being made.....	Renard
Order is tendered conditional upon shipment being made within ——.....	Repartee
Can secure order if prompt shipment is assured.....	Requiem
Can secure order if prompt shipment is assured within ——.....	Revenge
Reply immediately by wire.....	Audit
Answer by first mail.....	Recur
See our letter —— giving full particulars	Redemize

# Telegraph Code

FOR INQUIRING AND PURCHASING—Continued

## Questions

Have received no reply from you to our letter of ——— . . . . .	Redevair
Referring to your telegram of ——— . . . . .	Redcross
Referring to our letter of ——— . . . . .	Redden
Referring to our telegram of ——— . . . . .	Recurate
Inclosure mentioned in your letter of ——— not received. Mail same at once. . . . .	Redact
What is the carload rate of freight to ——— ?	Redcap
What is less than carload rate to ——— ? . . .	Recuit
Have you shipped order of ——— ? . . . . .	Ruby
When can you ship ? . . . . .	Rust
Send tracer immediately for shipment ———	Ryot
Wanted badly. When will you ship ? Answer . . . . .	Amber
We can furnish ——— immediately, balance ——— . . . . .	Relic

## FOR INQUIRING AND PURCHASING

## Answers

We have in stock and can furnish you at ——— . . . . .	Saddle
We have no ———, but will ship the other sizes promptly . . . . .	Saint
We can ship ——— from stock and the balance ——— . . . . .	Salad
We can furnish them (or it) at ——— . . . . .	Salt
None of the goods you order are in stock..	Salute
We cannot furnish. . . . .	Sambo
Impossible for us to fill your order in the specified time. . . . .	Sandman
If ordered by telegraph promptly, we could ship in ——— . . . . .	Sauce
Immediately on receipt of order. . . . .	Savor
Discount on ——— is ——— . . . . .	Scale
Will ship earlier if possible. . . . .	Scar

# Telegraph Code

FOR INQUIRING AND PURCHASING—Continued

## Answers

We cannot promise definitely.....	Scatter
We quote you —— discount on ——..	Scene
Per cent. discount specifications named...	School
F. O. B. cars, our works.....	Scoff
For immediate acceptance.....	Scold
F. O. B. cars, your city (or town).....	Scoop
We have all in stock and could ship at once,	Scope
F. O. B. here.....	Scorch
Free on board at —— .....	Scribe
Less a freight allowance per 100 lbs of ——	Scrub
We have entered your order for.....	Scud
Use your best judgment.....	Seckel
Use your best judgment and take order...	Seclude
The price of boiler tubes is to-day ad- vanced to —— .....	Secret
The price of pipe is to-day advanced to —— .....	Sedate
We will hold offer open.....	Selfish
We hereby withdraw all quotations.....	Senate
We do not make —— .....	Sense
We will commence making —— : .....	Serging
If necessary to take order.....	Servant
We can make length wanted by joining pieces together.....	Sewerage
Please specify the quantity wanted.....	Sham
We have none in stock but could furnish	Shade
Please specify the sizes and quantity wanted .....	Shark
Specifications very well assorted.. : .....	Shear
Send particulars by telegraph immedi- ately .....	Shell
Send particulars by mail.....	Shift
Telegraph to-morrow, early.....	Shoal
Your telegram is unintelligible. Please repeat .....	Shock
Referring to your letter of —— .....	Shrew



# Telegraph Code

FOR INQUIRING AND PURCHASING—Continued

## Answers

Referring to your telegram of ———	Shrill
In reply to your favor of ———	Shrub
Freight by rail, in carloads, per 100 lbs., is ———	Shuttle
Freight by rail, in less than carloads, is ———	Sigh
We cannot obtain through rate of freight to ———	Silk
Freight by water, in carloads, per 100 lbs., is ———	Sin
Freight by water, in less than carloads, per 100 lbs., is	Sip
Lowest freight rate is ———	Site
Ascertain and advise full particulars	Skin
We shipped your order on ———	Skip
We can ship on ———	Slide
Keep us fully advised	Sloth
Ascertain prices talked of	Sodom
See our letter of ———	Sofa
See our telegram of ———	Sojourn
Your letter was not received in time	Solution
Your telegram was not received in time	Sonorous
A general advance in prices is looked for	Sport
No indications at present of lower prices	Spout
We do not anticipate a decline in prices	Sprain
Extreme factory prices	Sprig
Subject to an additional discount of ———	Spright
Prices quoted are for immediate acceptance	Spring
Prices quoted are conditional upon im- mediate specification and prompt ship- ment	Sprinkle
Prices quoted are conditional upon ship- ment at our option within ———	Sprint
Prices quoted are conditional upon ship- ment at our convenience	Spruce

# Telegraph Code

FOR INQUIRING AND PURCHASING—Continued

## Answers

Prices quoted are subject to change without notice.....	Spry
Do not accept order at prices named.....	Spud
Do not depart from instructions given you.	Spume
Do not deviate from prices given.....	Spunk
We cannot deviate from prices given.....	Spur
Order is undesirable at prices named in your telegram or letter.....	Spurt
Present unsettled conditions will not warrant ——— .....	Sputter
Specifications must accompany acceptance of our offer.....	Squabble
Govern yourself according to circumstances, and use your best judgment....	Squall

## RELATING TO ORDERS AND SHIPMENTS

### Questions

When can you ship ——— ?.....	Tabby
When will you ship ——— ?.....	Tack
If not, when will you ship—— ?.....	Tag
Have you shipped order ?.....	Tail
Have you shipped us any —— ?.....	Taint
Shall we ship what we have ready ?.....	Tame
Shall we enter order ?.....	Tansy
Please send shipping instructions.....	Tar
Shall we furnish ?.....	Tartar
How much of specifications can you ship at once, and how long will it take to complete the balance ?.....	Tartaric

### Answers

We will ship.....	Task
We will ship from here.....	Taste
We will ship you immediately.....	Tatter
We will ship from Mill.....	Tount
We will ship from Factory.....	Tawny
We can ship on —— .....	Tavern
We will try to ship.....	Tea

# Telegraph Code

## RELATING TO ORDERS AND SHIPMENTS

### Answers

We have shipped.....	Temple
We have shipped per —— .....	Tenant
We shipped your order on —— .....	Tint
We expect to ship on the —— .....	Terron
We have not shipped .....	Text
We have ready for shipment .....	Thaw
We will complete.....	Thing
We have no order .....	Thrash
We have suspended work on your order...	Threat
We have suspended shipment of your order of —— .....	Thrill
We are waiting for —— .....	Throat .
We are holding the order for ——, Shall we ship balance without them?....	Thunder
Your telegram came too late to stop shipment .....	Ticket
We have been disappointed in delivery of —— .....	Tidne
In process of manufacture and cannot be cancelled without loss .....	Timber
Order is being executed and cannot be cancelled .....	Tinker
Too late to make any alterations in order now .....	Tissue
The alterations in order have been (or will be) made .....	Toast
Have changed order referred to and will ship .....	Token
We will trace through.....	Toll
We are tracing.....	Top
We cannot get iron.....	Topaz
Will make immediately upon receipt of iron .....	Torment
We cannot obtain through rate of freight to —— .....	Tornado
Not sooner than.....	Torpid
No later than .....	Totter

# Telegraph Code

## FOR ORDERING BOILERS

### Ames Firebox Boilers With Plain Furnace

805.....	Fable	818.....	False
808.....	Fagot	820.....	Famed
810.....	Fagus	823.....	Fancy
812.....	Fahan	825.....	Fangl
813.....	Faint	827.....	Fanon
814.....	Fairy	830.....	Farce
815.....	Faker	833.....	Fastu
816.....	Falca	837.....	Fatal
840.....	Favos		

### Ames Firebox Boilers with Down Draft Furnace

905.....	Feath	918.....	Fenks
908.....	Feder	920.....	Feoff
910.....	Fehme	923.....	Ferny
912.....	Felid	925.....	Fervu
913.....	Felon	927.....	Feuda
914.....	Feluc	930.....	Fever
915.....	Femur	933.....	Fewel
916.....	Fence	937.....	Feyre

### Pierce American Smokeless

STEAM		WATER	
S-266 .....	Smack	W-266 .....	Wad
S-267 .....	Small	W-267 .....	Waf
S-268 .....	Smalt	W-268 .....	Wag
S-269 .....	Smash	W-269 .....	Wall
S-326 .....	Smear	W-326 .....	We
S-327 .....	Smeath	W-327 .....	Weak
S-328 .....	Smell	W-328 .....	Web
S-329 .....	Smelt	W-329 .....	Weed
S-3210.....	Smerch	W-3210.....	Weep
S-407 .....	Smift	W-407 .....	Will
S-408 .....	Smight	W-408 .....	Willow
S-409 .....	Smilax	W-409 .....	Win
S-4010.....	Smile	W-4010.....	Wind
S-4011.....	Smirch	W-4011.....	Wine
S-4012.....	Smirk	W-4012.....	Wing
S-468 .....	Smock	W-468 .....	Wolf
S-469 .....	Smoke	W-469 .....	Won
S-4610.....	Smolder	W-4610.....	Wont
S-4611.....	Smolt	W-4611.....	Wood
S-4612.....	Smooth	W-4612.....	Work
S-4613.....	Smother	W-4613.....	World
S-4614.....	Smout	W-4614.....	Worth

# Telegraph Code

FOR ORDERING BOILERS—Continued

## Pierce American

STEAM		WATER	
S-214	Ogone	W-214	Ohack
S-215	Ogong	W-215	Ohale
S-216	Ogale	W-216	Oham
S-217	Ogalen	W-217	Ohare
S-265	Ovague	W-265	Oeager
S-266	Ovoid	W-266	Oeagle
S-267	Ovalet	W-267	Oearl
S-268	Ovalley	W-268	Oearn
S-325	Obalsam	W-325	Obabble
S-326	Obamboo	W-326	Obacon
S-327	Obanana	W-327	Obadger
S-328	Obanner	W-328	Obaffle
S-329	Obarren	W-329	Obaking
S-405	Owang	W-405	Owhip
S-406	Owing	W-406	Owhelp
S-407	Owoe	W-407	Owrap
S-408	Owolf	W-408	Owren
S-409	Owork	W-409	Owrit
S-4010	Owood	W-4010	Ohy
S-466	Omaker	W-466	Odash
S-467	Omask	W-467	Odater
S-468	Omercy	W-468	Odeck
S-469	Omince	W-469	Odent
S-4610	Ominer	W-4610	Odish
S-4611	Omock	W-4611	Odover
S-4612	Omusty	W-4612	Odust
S-4613	Omusk	W-4613	Odusk

## Pierce Down Draft

STEAM		WATER	
S-844-B	Drab	W-844-B	Dragon
S-845-B	Draba	W-845-B	Drail
S-846-B	Drabet	W-846-B	Drain
S-847-B	Drabish	W-847-B	Drainage
S-848-B	Drable	W-848-B	Draner
S-849-B	Draf	W-8412-B	Drake
S-8410-B	Drag	W-849-B	Dram
S-8411-B	Dragade	W-8410-B	Dramer
S-8412-B	Dragle	W-8411-B	Dramat



# Telegraph Code

FOR ORDERING BOILERS—Continued

## Pierce Pebco

STEAM		WATER	
S-913.....	Peach	W-913.....	Peddler
S-914.....	Pedal	W-914.....	Pelt
S-923.....	Peat	W-923.....	Peck
S-924.....	Pease	W-934.....	Pebble
S-933.....	Pear	W-933.....	Pence
S-934.....	Pesky	W-934.....	Pent
S-935.....	Pennant	W-935.....	Pensive
S-943.....	Pecan	W-943.....	Pepper
S-944.....	Pen	W-944.....	Peerd
S-945.....	Penlite	W-945.....	Peevit
S-953.....	Pectir	W-953.....	Pepbic
S-954.....	Peg	W-954.....	Percer
S-955.....	Pelf	W-955.....	Peril
S-963.....	Peptic	W-963.....	Pester
S-964.....	Period	W-964.....	Petard
S-965.....	Perky	W-965.....	Pewter

## Pierce Little Giant Tank Boiler

FLAT TOP		DOME TOP	
1010.....	Teasel	1110.....	Tabard
1012.....	Teller	1112.....	Tablet
1015.....	Temper	1115.....	Tacit
		1117.....	Tailor
		1119.....	Talent
		1122.....	Tandem

## Pierce Laundry Boilers

111.....	Aard	101.....	Abaft
123.....	Abaca	112.....	Abba
8.....			Aglow

# Telegraph Code

## FOR ORDERING RADIATORS

Pierce, One Column, Plain — Steam....	Poise
Pierce, One Column, — Steam .....	Poison
Pierce, One Column, Plain — Water.....	Poke
Pierce, One Column, — Water .....	Polar
Pierce, Two Column, Plain — Steam.....	Polder
Pierce, Two Column, — Steam .....	Pole
Pierce, Two Column, Plain — Water.....	Policy
Pierce, Two Column, — Water.....	Police
Pierce, Three Column, Plain — Steam...	Polish
Pierce, Three Column, — Steam .....	Polite
Pierce, Three Column, Plain — Water...	Pollen
Pierce, Three Column, Water .....	Pollute
Pierce, Four Column, Plain — Steam....	Pome
Pierce, Four Column, — Steam .....	Pomice
Pierce, Four Column, Plain — Water....	Pomp
Pierce, Four Column, — Water .....	Pond
Pierce, Six Column Window, Plain.....	Pontoon
Special High Legs.....	Pony
Radiator Pedestals.....	Pool
Pierce Dining Room Radiator.....	Poodle
Pierce, Wall, One Column, Plain — Steam	Poppet
Pierce, Wall, One Column, Steam.....	Populace
Pierce, Wall, One Column, Plain — Water	Popular
Pierce, Wall, One Column, Water .....	Porch
Pierce, Wall, Two Column, Plain — Steam	Poor
Pierce, Wall, Two Column, Steam .....	Porcelain
Pierce, Wall, Two Column, Plain — Water	Pork
Pierce, Wall, Two Column, Water.....	Porous
Pierce, Wall, Three Column, Plain—Steam	Porridge
Pierce, Wall, Three Column, Steam .....	Port
Pierce, Wall, Three Column, Plain—Water	Portal

# Telegraph Code

## FOR ORDERING RADIATORS—Continued

Pierce, Wall, Three Column, Water .....	Porter
Pierce, Wall, Four Column, Plain—Steam	Portico
Pierce, Wall, Four Column, Steam .....	Portion
Pierce, Wall, Four Column, Plain—Water	Portland
Pierce, Wall, Four Column, Water .....	Portray
Pierce, Wall, Five Foot, Plain—Steam....	Yak
Pierce, Wall, Five Foot, Plain—Water....	Yam
Pierce, Wall, Seven Foot, Plain—Steam....	Yankee
Pierce, Wall, Seven Foot, Plain—Water....	Yap
Pierce, Wall, Nine Foot, Plain—Steam ....	Yack
Pierce, Wall, Nine Foot, Plain—Water....	Yeast
Pierce Pin, Indirect, 15 sq. ft. per section —Steam .....	Eruption
Pierce Pin, Indirect, 15 sq. ft. per section —Water .....	Erebus
Pierce, Pin, Indirect, 20 sq. ft. per section Water .....	Epopée
Pierce, Pin, Indirect, 20 sq. ft. per section Steam .....	Epitomize

## NUMBER OF SECTIONS

2 Sec. ....	Insino	19 Sec. ....	Integ
3 " .....	Insid	20 " .....	Intel
4 " .....	Insip	21 " .....	Intem
5 " .....	Insist	22 " .....	Intense
6 " .....	Insistis	23 " .....	Intensely
7 " .....	Insuls	24 " .....	Intensif
8 " .....	Insut	25 " .....	Intensos
9 " .....	Insume	26 " .....	Intenti
10 " .....	Insum	27 " .....	Intently
11 " .....	Insur	28 " .....	Intepent
12 " .....	Intab	29 " .....	Interact
13 " .....	Intac	30 " .....	Interapti
14 " .....	Intacco	31 " .....	Inteval
15 " .....	Intam	32 " .....	Interars
16 " .....	Intana	33 " .....	Interax
17 " .....	Intanto	34 " .....	Intercalo
18 " .....	Intard	35 " .....	Interclos

# Telegraph Code

## TAPPING INSTRUCTIONS

1 x 1 in.....	Isear
1 in. single pipe.....	Iscarloch
1 $\frac{1}{4}$ in. x $\frac{3}{4}$ in.....	Isease
1 $\frac{1}{4}$ x 1 in.....	Iseater
1 $\frac{1}{4}$ x 1 $\frac{1}{4}$ in.....	Isecho
1 $\frac{1}{4}$ in. sgl. pipe.....	Iseddy
1 $\frac{1}{2}$ x 1 in.....	Isedge
1 $\frac{1}{2}$ x 1 $\frac{1}{4}$ in.....	Iselote
1 $\frac{1}{2}$ x 1 $\frac{1}{2}$ in.....	Iselbow
1 $\frac{1}{2}$ in. sgl. pipe.....	Iselk
2 x 1 $\frac{1}{2}$ in.....	Iselope
Tapped regular for sgl. pipe steam.....	Isenbark
Tapped regular for double pipe steam.....	Iselict

## NUMBER OR ORDER NUMBERS

1.....	Eagerness	23.....	Elk
2.....	Ear	24.....	Elope
3.....	Earache	25.....	Elude
4.....	Earlock	26.....	Embalm
5.....	Earmark	27.....	Embark
6.....	Earnest	28.....	Emblaze
7.....	Earring	29.....	Emblem
8.....	Ease	30.....	Emboss
9.....	Eater	31.....	Embrace
10.....	Eaves	32.....	Emerge
11.....	Echo	33.....	Emery
12.....	Eclipse	34.....	Emetic
13.....	Eddy	35.....	Eminent
14.....	Edge	36.....	Emotion
15.....	Editor	37.....	Empale
16.....	Efface	38.....	Employ
17.....	Elate	39.....	Empty
18.....	Elbow	40.....	Enable
19.....	Elder	41.....	Enact
20.....	Elect	42.....	Encamp
21.....	Elfish	43.....	Enchant
22.....	Elicit	44.....	Enclose

# Telegraph Code

## NUMBERS OR ORDER NUMBERS—Continued

45.....	Encore	82.....	Estate
46.....	Encounter	83.....	Esteem
47.....	Encroach	84.....	Estrange
48.....	Endear	85.....	Evade
49.....	Endorse	86.....	Event
50.....	Endless	87.....	Evilness
51.....	Endow	88.....	Evince
52.....	Enemy	89.....	Evoke
53.....	Energy	90.....	Ewe
54.....	Engage	91.....	Exalt
55.....	Engulf	92.....	Exceed
56.....	Enjoin	93.....	Exclaim
57.....	Enlarge	94.....	Exclude
58.....	Enlist	95.....	Excuse
59.....	Enough	96.....	Exempt
60.....	Enrage	97.....	Exhale
61.....	Enrapt	98.....	Exhibit
62.....	Enrich	99.....	Exhort
63.....	Enroll	100.....	Exhume
64.....	Enshroud	200.....	Exist
65.....	Ensign	300.....	Expect
66.....	Ensue	400.....	Expend
67.....	Entail	500.....	Expert
68.....	Enthroned	600.....	Expire
69.....	Entice	700.....	Explain
70.....	Entomb	800.....	Explore
71.....	Entrap	900.....	Expose
72.....	Entrance	1000.....	Expound
73.....	Entwine	2000.....	Expulst
74.....	Envy	3000.....	Extend
75.....	Envelope	4000.....	Exterior
76.....	Erection	5000.....	Extinct
77.....	Erminess	6000.....	Extort
78.....	Errandless	7000.....	Extract
79.....	Escape	8000.....	Extreme
80.....	Essay	9000.....	Exult
81.....	Essence	10000.....	Eyelid



# Telegraph Code

## DAYS AND MONTHS

Date	Cipher Word	Date	Cipher Word
1st.....	echoing	17th.....	embassy
2nd.....	eclair	18th.....	embedded
3rd.....	eclat	19th.....	embero
4th.....	edict	20th.....	embody
5th.....	edify	21st.....	emboit
6th.....	editress	22nd.....	emboils
7th.....	edicate	23rd.....	embroli
8th.....	effable	24th.....	embrut
9th.....	effete	25th.....	emetine
10th.....	effigy	26th.....	emit
11th.....	eider	27th.....	empaill
12th.....	eject	28th.....	emote
13th.....	egypt	29th.....	empalen
14th.....	eland	30th.....	emplead
15th.....	elapse	31st.....	employer
16th.....	elderly		

## MONTHS

Date	Cipher Word	Date	Cipher Word
January.....	eldest	July.....	empower
February.....	electric	August.....	emprint
March.....	electro	September.....	emulate
April.....	elegant	October.....	emelous
May.....	elegist	November.....	enactor
June.....	elegy	December.....	enamel

## TIME

	Cipher Word		Cipher Word
1 day.....	element	3 weeks.....	endur
2 days.....	elephant	1 month.....	endive
3 days.....	elevate	2 months.....	encave
4 days.....	elicted	3 months.....	encrusted
5 days.....	elevan	4 months.....	endict
6 days.....	emanate	5 months.....	endmost
10 days.....	emband	6 months.....	endroit
1 week.....	embank	1 year.....	endroiting
2 weeks.....	enfant		





# PIERCE

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PIERCE

MARK

1923

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# FITTER